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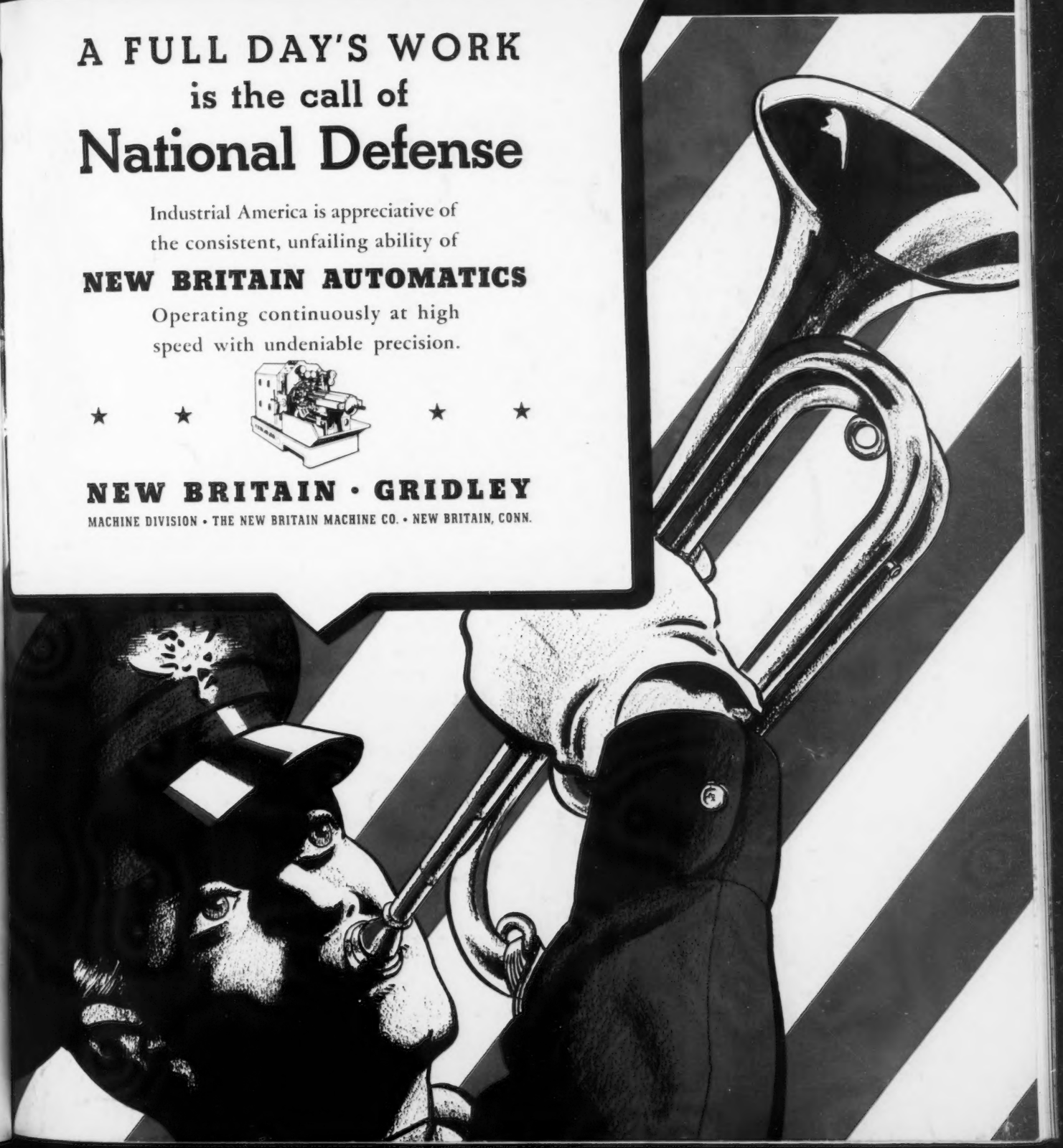

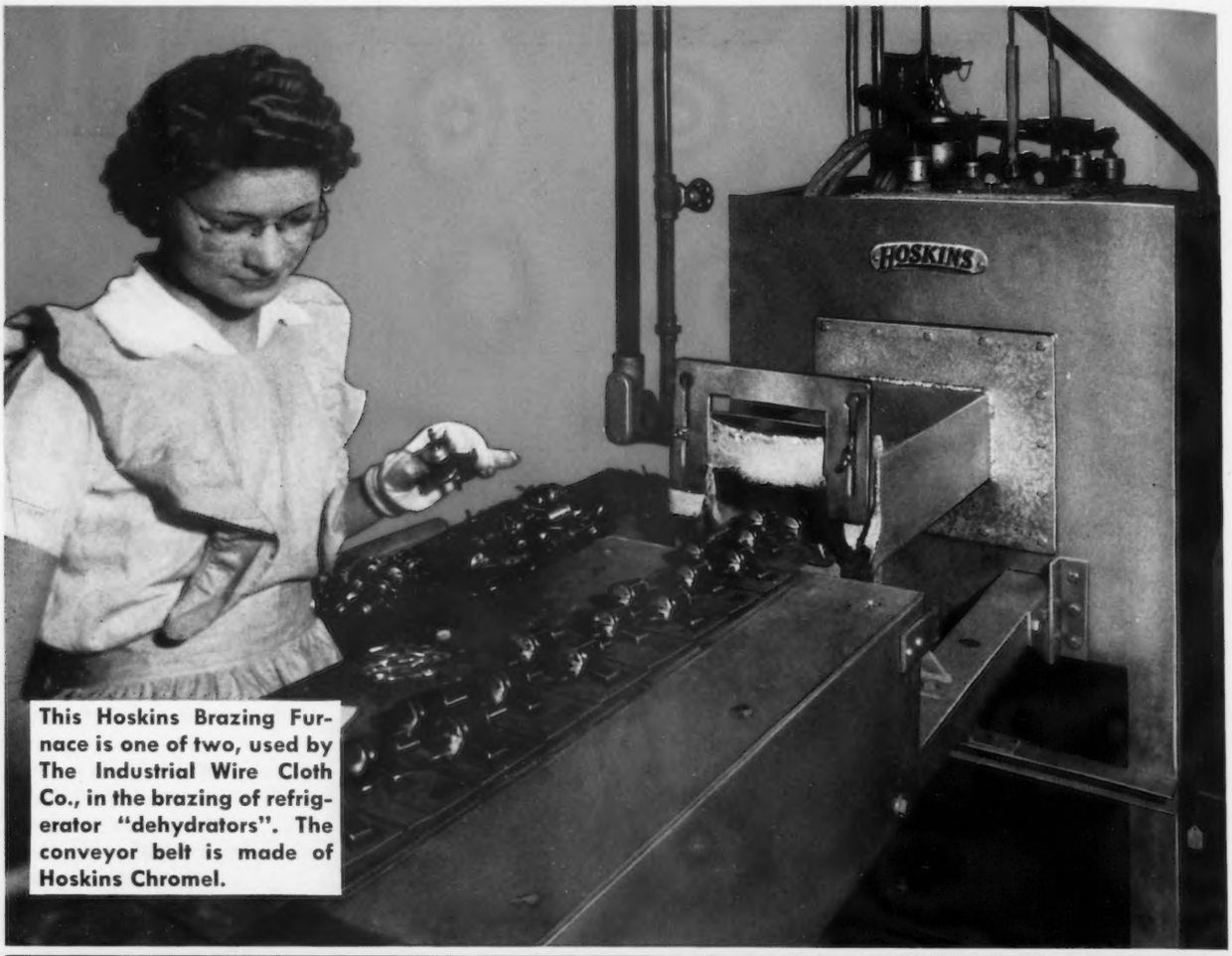

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AUGUST 14, 1941

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The Problem of Steel Procurement

An Explanation of the Situation and Suggestions for Procedure

★ Today, the steel industry is producing at the rate of about 87 million tons a year. That is 29% more than in any previous year. However, 25 to 35% must be reserved for Defense, and this, plus growing commercial requirements, has brought about a temporary steel shortage.

Steel production is being increased, but because Defense needs are increasing, too, it is difficult to say when there will be ample steel for all requirements.

Anticipating this situation, Ryerson entered the emergency with very large and complete stocks in every one of its ten steel service plants. These stocks enabled many customers to get started quickly on important Defense projects. They were sufficient, also, to supply industries whose continued operation means jobs and incomes for millions not engaged in direct Defense.

The demand for Ryerson Certified Steels has been so great that our stocks have been substantially reduced and we are now out of many sizes. We are supplying urgent demands as fast as possible. It is particularly important at this time to take care of miscellaneous requirements from warehouse stocks because, if these rush orders had to be filled promptly by the steel mills, rolls would have to be changed, time would be lost, and production greatly reduced.

In giving best possible service to all of our customers, we will probably continue to run short of many types and sizes. Possibly, some type of allocation system may even become necessary. In the meantime, to meet the situation, we are making four suggestions:

One: Write on every order the use for which the steel is intended. If for Defense purposes, indicate contract project number or preference rating and number. We will then classify the Defense and non-Defense tonnage and report to the OPM. As a very substantial percentage of our steel has been used for Defense, we believe this plan will prove helpful and enable us to continue to serve you.

Two: Send us your orders, not inquiries, so that valuable time will be saved and there will be no chance of steel, if on hand, being sold while the quotation is being made.

Three: List possible alternate sizes, gauges, and qualities that you could use if your exact requirements are not in stock.

Four: We urge your cooperation in conserving stocks and making them available to the largest number of users. Please try to avoid the tendency to order more than is required, for this is the surest way to create additional shortages that may prove serious to all.

For 99 years we have served industry through prosperity and depression—peace and war—and expect to continue to serve for many years to come. We appreciate the patience and understanding of our friends and customers in this national emergency and want you to know that we will continue to work with you on this problem of steel.

Everett D. Graff
PRESIDENT

JOSEPH T. RYERSON & SON, INC.

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THE IRON AGE

AUGUST 14, 1941

ESTABLISHED 1855

When Balloons Are in Order, Inflate

WE HAVE no quarrel with Price Administrator Henderson. In fact, we find him in agreement with us, if somewhat belated, as to the inevitability of inflation. (THE IRON AGE is on record as predicting this some six months ago.)

What we do object to is his using the scrap steel industry to be one of the inflation scapegoats.

As publishers, I may point out that we cannot be accused of mercenary motives in coming to the defense of that industry. If you were to make up a list of the non-advertising branches of the metal working industry, I dare say that the scrap dealers would head the list.

Also, if you were to attempt to catalog individuality in American enterprise, this branch of our industry would have to appear on page one. Until the ceiling was clamped on scrap, this commodity was the most volatile as to price movement of the many that are listed from week to week in our price pages.

American scrap dealers and brokers have been brought up on individualistic practices based upon close competition and shrewd dealing mixed with a certain degree of speculation. If that is a crime, it has not as yet been written in the statute books. It is probably true, as Mr. Henderson says, that the scrap industry is dominated by 10 or 15 large concerns; but the same thing is true of almost every industry in this country. We might even point out that less than that number of individuals are dictating the diplomatic, military and economic policies of the United States today.

What Mr. Henderson overlooks, in our opinion, is that you cannot cure or remedy an infraction of economic law by sticking a courtplaster over it. The causes of inflation in this country are not in the price rises that are taking place. They are deeper than that. This inflation is the direct and inevitable result of the "squanderation" policy that has been in effect for the past nine years and that has brought us to the brink of war with the greatest national indebtedness of any country, any where, at any time.

You can't cure that with price ceilings.

You can't cure scrap shortages with a price ceiling. Such a ceiling, in fact, induces and invites shortages.

In the last World War, scrap was set at $29.00 a ton. Today it is set at $20.00. (Agricultural parity exponents please note.) In spite of this, more scrap is being collected and delivered than ever before in our history and at less profit.

Yes, we need more than even this to prevent a shortage. There are thousands of tons of reclaimable trolley rails, for instance, buried under our streets. But the "scrappies" can't unearth them at $20.00 a ton.

And the same thing goes for many other commodities in which we are experiencing or anticipating shortages. If you want to dance, you have to be willing to pay the piper.

J. H. Van Deventer

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INLAND STEEL COMPANY, CHICAGO, ILLINOIS

Testing Pneumatic Chisel Steels

By E. K. SPRING
Metallurgist
and
J. K. DESMOND
Sales Metallurgist, Henry Disston & Sons, Inc., Philadelphia

Common practice in testing chisels has been to compare performance of a new chisel to one already in service on a particular job. Laboratory facilities have done much to test chisels and chisel steels further, revealing a great deal of information unavailable by comparative methods of testing.

THE billet chipping test for pneumatic chisels, which has for a long time been regarded highly as a method of testing the comparative worth of various types and kinds of chisels, has, during the past few years, been supplemented with tests that are carried out under laboratory conditions. While these comparative mill tests of chisel qualities show which chisel is the best of a lot, laboratory tests permit more exact observations on the manner in which a chisel wears, reasons for failure, effects of changing air pressures, speed and thickness of cuts, and performance of experimental chisel steels.

Such laboratory chipping follows a more or less standard procedure. The chipping is done along the edge of plates ½ in. thick by 36 to 48 in. long and about 20 in. wide. Mounted on the long edge in an iron frame and secured rigidly by four bolts extending through the sides of the frame and through the plate itself, the plate is thus held in position for the test. A vertical member on one end of the frame is fitted with pulleys carrying wire ropes attached to a standard No. 2 pneumatic hammer and weighted on the other end with a 20-lb. weight. The weight on the end of the wire rope assists the chipper in making continuous cuts and helps guide the air hammer across the length of the plate on the narrow ½-in. edge. Plates of different analyses and degrees of hardness are first tried in trial runs to establish satisfactory conditions of cutting.

In the following typical test, plates of 174 Brinell hardness, analyzing C—0.43, Mn—0.75, P—0.022; S—0.022, Si—0.22, were found suitable for obtaining chipping data and were established as a standard for this particular run of tests. Moderately long chisel life, chips about ⅛ in. thick and of fairly uniform weight per cut across the plate, and curled chips that were easy to gather and weigh were found to be the advantages in using this plate. The weight lost by each chisel in making a cut and the weight of the chips were carefully recorded as part of the data necessary for computing chisel performance.

Flat edge ¾-in. octagon pneumatic cold chisels were used throughout the tests recorded. The shank ends of the chisels were forged and the chisel blanks were then heat treated according to the analysis of the blank so they would be within a range of from 45 to 50 Rockwell C hardness. This hardness range over a period of years has been found to be satisfactory for shanks, it being rare for a shank within this range to break.

The beveled cutting edge of the experimental chisels were carefully ground to 60 deg., and to a uniform thickness of .150 to .156 in. at the back edge of the cutting bevel. The ⅞-in. cutting edge was ground exactly on the center axis of the tool, because locating the cutting edge off the center axis was found to cause the edge to snip or spall due to the moment of forces around the edge caused by the piston blow, and the resistance of the material being cut by the chisel. The corners of the edge were filleted to a 1/16-in. radius, as previous tests proved the corners did no cutting and broke during the first few cuts. While the corner breakage was minute and had no effect on the cutting qualities of the chisel, this loss of weight, not the result

of wear, would throw into error the calculations made from the tests.

In the tests, four types of chisels and three chisels of each type were used. The three chisels of each analysis reported were handled as units, heat treated and tested together. The chipping was done with the same side of the chisel always to the plate. The following are the chisel steels used:

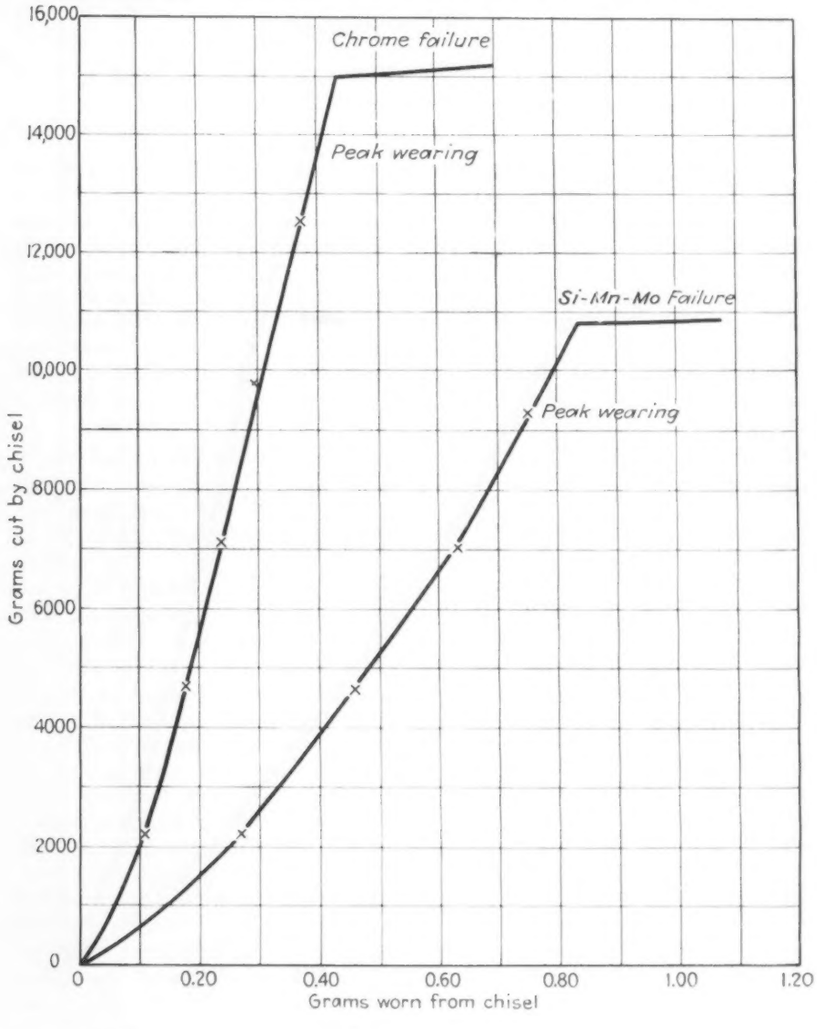
Type	C	Mn	Si	Cr	W	Va	Mo
Carbon	0.81	0.33	0.29	...	...	...	...
Tungsten	0.49	0.32	0.15	1.09	2.12	0.22	...
Silico-Manganese-Molybdenum	0.57	0.77	1.49	...	...	0.16	0.58
Chrome	0.46	0.76	0.64	2.44	...	...	0.63

Table I shows the data for the first 10 individual cuts, for every tenth cut following, and the composite for all the cuts.

With the exception of the carbon steel chisel, which has its best wearing rate at the beginning of its run, Table I shows that a chisel builds up to a peak wearing rate which falls off when tool failure is near. A typical wearing curve for the silico-manganese-molybdenum and for the chrome steel chisel is plotted from the data accumulated and illustrated in Fig. 1. The weight loss of the chisel is considered as worn off, but it is likely, particularly at the start of chipping, that the sharp edge is sheared by the compressive blows, and minute pieces break off rather than wear away. However, as cutting continues, the chisel generally loses progressively less weight in proportion to the weight of chips cut until the time of failure, when it loses the greatest part of its weight.

SET-UP used to test chisel steels. A frame and the wire rope attached the chipper make continuous cuts and narrow edge

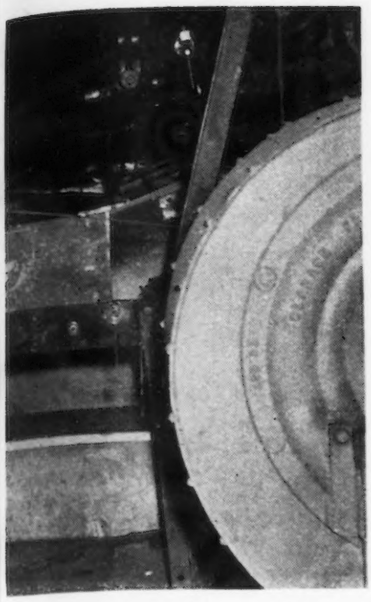
FIG. 1—Wearing curve for chrome and Si-Mn-Mo steels.



Inspection shows that after a few cuts, dark lines showing stressed material appear on the under side of the cutting bevel parallel to the cutting edge. On continued cutting, new lines appear likewise parallel to the edge of the tool and behind the original lines. These lines, at first are only visible under a glass, but without exception, one of the later lines develops into an open rupture, plainly visible to the naked eye. This, however, is before the time of failure of the chisel, and the tool is capable of cutting for a long time after the crack is seen.

Chisel Failure

It is likely the compressive loads applied on the cutting edge by the action of chipping first shears the bevel very near the edge where the bevel thickness approaches zero. The area of shearing stresses is moved back into the bevel as the edge is worn away or the first stressed areas are broken out. Finally, the position of the edge does not change fast enough to move the area of shear, and the stress is concentrated, promoting an open rupture. The chisel can-



steel plate is securely mounted in the to the air hammer is weighted to help to guide the hammer across the of the plate.

not wear away beyond this rupture, and it is the piece of bevel bounded by the rupture which breaks out and causes tool failure. The weight of the beveled cutting edge, considered as that volume between the cutting edge and the back bevel edge thickness of 0.150 in., was about 1.4 grams, and it was found from Table I that the greatest loss in weight from a chisel occurred on the last cut. Prior to the final cut only a small percentage of the weight of the bevel was worn away.

In testing chisels, a number should be run and average results taken, since it is not at all unusual to obtain varying results from a lot processed in a seemingly identical manner. Unlike testing fixed tools, like a drill, tap or lathe tool where constant angles are presented to the work, chisel testing has other factors, such as the angle of the chisel with relation to the work, thickness and length of cuts, and the skill of the chipper, that play a determining part in obtaining accurate data.

Hard Plate Test

The life of all chisels was greatly shortened by increasing the hardness of the plate from 174 Brinell to 302 Brinell. The cutting conditions on this 302 Brinell plate were more like those encountered when chipping unannealed billets. Short

Table I

Air Pressure on Hammers—80 lb. per sq. in.

Type of Steel	Treatment	Rockwell C	Cuts Made	Weight Loss of Chisel Grams	Weight of Chips Grams	*Rating
Carbon	1450 deg. F. water 425 deg. F. oil, 2 hrs.	61-62	1st	0.01	207.1	
			2nd	0.01	228.6	
			3rd	0.02	223.7	
			4th	0.03	222.7	
			5th	0.02	234.6	
			6th	0.60	none	
Total Cuts, Chisel Loss and Weight of Chips			6	0.69	1116.7	1,618
Tungsten	1650 deg. F. oil 380 deg. F. 2 hrs.	58	1st	0.02	241.8	
			2nd	0.01	226.2	
			3rd	0.01	247.8	
			4th	0.01	245.9	
			5th	0.02	240.0	
			6th	0.01	249.2	
			7th	0.01	245.2	
			8th	0.01	243.7	
			9th	0.01	247.5	
			10th	0.01	247.5	
10-Cut Total				0.12	2424.4	
			20th	0.14	2396.8	
			21st	0.14	238.1	
Total Cuts, Chisel Loss and Weight of Chips			21	0.040	5059.9	12,648
Silico-manganese-molybdenum	1150 deg. F. water 450 deg. F. 2 hrs.	59-60	1st	0.03	234.7	
			2nd	0.04	235.3	
			3rd	0.02	223.9	
			4th	0.03	200.4	
			5th	0.02	221.9	
			6th	0.02	227.6	
			7th	0.03	227.4	
			8th	0.02	230.5	
			9th	0.03	228.9	
			10th	0.03	231.6	
10-Cut Total				0.27	2261.6	
			20th	0.20	2365.9	
			30th	0.16	2372.1	
			40th	0.12	2374.7	
			46th	0.08	1397.9	
			47th	0.24	78.7	
Total Cuts, Chisel Loss and Weight of Chips			47	1.07	10,850.9	10,141
Chromium	1650 deg. F. oil 380 deg. F. 2 hrs.	58	1st	0.01	196.2	
			2nd	0.01	208.2	
			3rd	0.01	216.4	
			4th	0.01	220.7	
			5th	0.01	236.9	
			6th	0.02	237.2	
			7th	0.01	246.9	
			8th	0.01	230.9	
			9th	0.01	227.9	
			10th	0.01	246.6	
10-Cut Total				0.11	2267.9	
			20th	0.07	2451.1	
			30th	0.06	2443.7	
			40th	0.06	2644.9	
			50th	0.07	2739.8	
			59th	0.07	2422.4	
			60th	0.25	260.2	
Total Cuts, Chisel Loss and Weight of Chips			60	0.69	15,230.0	22,072

* Chisel wearing rate is computed by dividing weight of chips cut by weight lost from chisel.

chips flew off the plate and it was frequently necessary to re-introduce the tool into the work. Chipping on this hardened plate with 80 lb., air pressure did not allow heavy cuts, and the chisels lost as much weight on this plate as they did cutting 10 to 15 times the weight of chips on the 174 Brinell plate. The tungsten chisel cut more chips than any of the other chisels under these severe conditions.

By increasing the air pressure from 80 lb. to 112 lb., per sq. in., and using the original 174 Brinell plate, the endurance of the chisels was decreased. In this test, the chisels lost as much weight as they did cutting 50 per cent to 200 per cent more chips under 80 lb., pressure. The weight of chips cut by the tungsten, Si-Mn-Mo and chrome chisels operating at 112 lb., pressure were nearly equal, the chrome chisel losing less weight and cutting more chips than the others.

In a test of cutting time for a chisel, time required to chip one foot of plate was reduced from 1 min., 40 sec., at 80 lb., pressure, to 1 min., 10 sec., at 100 lb., pressure, and 1 min., 8 sec., at 112 lb., pressure. The chisel took heavier cuts as the pressure was increased, but lost more weight per cut. At 112 lb., pressure, the cutting time was reduced 32 per cent, weight of chips increased 50 per cent and the wearing rate of the tool was 100 per cent faster than at 80 lb., pressure.

Test Results

In all of the described tests, the chisels wore or lost weight at a diminishing rate until near the point of failure. On the last cut a large percentage of the total bevel weight broke out between the edge of the tool and the back bevel, the thinnest section of the tool. This is natural, however, as loads are placed on the thin cutting edge by the piston blows and the metal in back of the edge is of graduated thickness. At some thickness near the edge, in the beginning of the test, and further back on the bevel as the test progresses, the section is not capable of withstanding the blows and an ordinary shear of this bevel takes place. Ultimately the volume of the bevel, limited by the sheared area will break out and prevent the chisel from continuing to cut.

When the chipping was less severe, as determined by the air pressure on the hammers and the thickness of the cut, the tool had longer life and higher chipping rating. Lighter cuts and light air pressure will prolong the life of the chisel. Furthermore, the tool will cut an enormous quantity of chips (30 to 40 lb., from a test plate). However, tests revealed that 50 per cent heavier cuts could be made in 32 per cent less time using increased air pressures. The saving of the chipping time would probably reduce chipping costs and not be counter balanced by re-sharpening, re-dressing and chisel replacement costs that are increased by higher pressures.

The results from this test work are based on empirical data obtained by cutting with test chisels. An attempt to translate the forces imposed on the tools during work into a requirement of physical properties for a chisel steel, or, to conversely interpret the obtainable physical properties of a steel into reasons for its suitability for chisels, is difficult. While cutting a plate of 90,000 lb., tensile and 55,000 lb., elastic in this test, the pneumatic chisels are struck 2200 blows per min. by a $1\frac{1}{8}$ in. piston weighing one lb., and moving three in., under 90 lb., per sq. in., pressure. Consequently, excellent physical properties of the chisel steel are necessary. High compressive strength of chisel steel, to permit the edge to hold up, and a good elastic limit to withstand fatigue, are probably the first physical requirements. During the tests described, none of the chisels broke except at the cutting edge, and it is believed, except for extraneous reasons, a chisel should fail only on the cutting bevel.

Surface Finish vs. Bearing Capacity

INCREASE in load carrying capacity of a babbitted journal bearing with increasing smoothness of the journal is indicated by tests made in the lubrication laboratory of Massachusetts Institute of Technology and reported upon in the June, 1941, issue of *Journal of Applied Mechanics*, published by the American Society of Mechanical Engineers. Funds for the research were provided by the Chrysler Corp., which developed the Superfinishing process.

Surface finishes produced in various ways having surface roughnesses ranging from 130 to 1 micro-in. as measured by the profilometer, have little or no effect on the performance of a partial journal bearing while it is operating under true hydrodynamic lubrication at low unit loads. In the lower limit of the region of hydrodynamic lubrication for a given journal bearing, however, the friction coefficient is markedly dependent upon the surface finish of the journal. For good performance, surface roughness should be reduced to less than 15 micro-in. at least.

By means of a sensitive method of determining iron in oil to the extent of one part in 10,000,000,000, it has been possible to measure the amount of run-in wear of journals by determining the amount of metal carried into the oil. It was found that the running-in period takes place in a short time, of the order of ½ to 1 hr. Wear practically ceases at the end of 2 hr. The initial rate of wear is high and falls off fairly rapidly. Under constant pressure conditions, a remarkable straight-line relationship exists between wear at the end of 2 hr. and the degree of surface finish, as shown by the accompanying table:

Type of Surface	Surface Finish Micro-In.	Total Iron Loss After 2 Hr., Mg.
Superfinish	1	0.04
Ground	6-7	0.09
Ground	13	0.15
Ground	45	0.41
Ground	75	0.66

For the above data, the bearing pressure was 43 lb. per sq. in. In any instance, the amount of metal removed was infinitesimal, since 1 mg. of iron if distributed evenly over the whole bearing surface would have a depth of only one millionth of an inch, or 1 micro-in. Actually, metal is not removed in a uniform layer, since examination of the test shafts showed both smoothed areas, untouched areas and sometimes just small scratches.

Basic Open Hearth

By J. H. CHESTERS
Central Research Department, United Steel Companies, Ltd., Sheffield, England

PART TWO of a series of three articles on basic refractories for below the sill plate level. Attention is given herein to the refractories for the lander, gas and air uptakes and gas and air slag pockets.

IN general the steel passes through the tap hole down a chute (known as a lander or launder) which is lined with firebrick and coated with "ganister." Attempts have been made to line landers with basic bricks with a view to obtaining steel of increased cleanliness, but such experiments have proved fruitless and have, at least for the most part, been abandoned. The durability of chrome magnesite bricks in this position was found to be very low due to damage caused by removal of skulls and mechanical shock when the lander was tipped.

Where "ganister" (clay bonded quartzite) is employed it is essential that it be prepared with adequate control, since any wide variation in the grading, clay content, or moisture content, may result in trouble. Thus, if the clay or water content is too high, abnormal shrinkage may occur and the ganister crack and come away from the firebrick backing, while if the grading is abnormally coarse it will be too gritty to trowel well on to the firebrick chute. A typical lander bath is given in Table III. Almost any good ganister or quartzite is suitable provided it is properly ground, and indeed it is doubtful whether the use of really high grade material is justified for this purpose. In works where the same ganister is employed in other more severe positions, namely, in the tap holes of acid furnaces, the best material is, of course, essential. In one of the United Steel Companies' works the grading of the batch is controlled in a very simple way, the grinders being provided with a spring balance, a half-pint cup, and a 7 (BSI) mesh sieve. The material is fed into a solid bottom edge mill together with a suitable amount of water and ground until a certain weight of material remains on a 7-mesh sieve from a cupful of sample. The gradings given in Table III, which were taken at weekly intervals over a period of a month, show that remarkably consistent results can be obtained in this way.

The lander is dried out prior to use either with a coal fire or with coke oven gas flares and is in general, repaired after each cast.

Gas and Air Uptakes

*Sections 2 and 4**

(A) CONSTRUCTION:

The gas uptake (or downtake) is essentially a rectangular tube connecting the outside end of the gas port to the gas slag pocket. On an 80-ton furnace it is about 2 ft. 6 in. to 3-ft. square and has a wall thickness of about 18 in. on the side farthest from the furnace.

The air uptakes, of which there are two at each end, one on either side of the gas uptake, are larger, being about 6 ft. x 3 ft. 6 in. in section on an 80-ton furnace. The optimum dimensions vary with the size and design of the furnace, but should always be sufficient to avoid any serious drop in pressure. The

TABLE III—Batch Composition and Grading of Lander Ganister

		Tons
Lander Ganister Batch:	Rock ganister (97 per cent SiO_2)	6.00
	Used roof bricks	0.75
	Siliceous clay	0.50

B.S.I. Sieves	Nearest Tyler Sieve Equivalents	Standard Grading, Per Cent	Typical Gradings —Over One Month, Per Cent—			
on 7 mesh	on 8 mesh	15	18.6	18.4	21.2	16.4
7-25	8-28	30	28.4	30.2	25.8	29.6
25-72	28-65	10	7.8	7.4	8.4	5.4
Through 72	Through 65	45	45.2	44.0	44.6	48.6

*Diagram illustrating nomenclature of parts marked "Sections" appeared in THE IRON AGE, May 22, 1941, p. 41.

FIG. 3 — Open hearth furnace uptake after use. Note irregular erosion due to swirling gases.

exposed walls of the air uptakes are also about 18 in. thick.

(B) MATERIALS:

The uptakes are normally built of first class silica brick of the type used in back-wall, front-wall and port construction (see THE IRON AGE, May 22 and 29, 1941). In the "all basic" furnace the uptakes are built of chrome magnesite bricks, but bursting due to iron oxide absorption is then very serious, and it is unlikely that this procedure would prove economical with the ordinary furnace even if the constriction of such uptakes due to adherence of basic dust could be overcome. Attempts to use a veneer of chrome magnesite bricks with a silica backing have not met with much success. The use of metal-case magnesite bricks, at least in the top sections of the uptakes, shows more promise.

(C) LIFE AND CAUSES OF FAILURE:

Both the air and gas uptakes in an 80-ton furnace have a life of about one year, the brick consumption being of the order of 1 to 2 lb. per ton of steel produced. The temperatures are not very high, being about 2192 deg. F. for the incoming and 3002 deg. F. for the outgoing gases, but the abrasion by the swirling dust laden gases is particularly bad. The abnormal wear which results is illustrated by Fig. 3.

(D) LINES OF IMPROVEMENT:

(1) It is possible that some improvement might be obtained by changing from a rectangular to an oval or circular construction, or by thickening those parts which are subject to the maximum attack.

(2) Since the temperatures are not particularly high a brick that was dense and particularly well crystallized but not necessarily of so high a melting point might give better service.

Gas, Air Slag Pockets

Sections 17 to 25

(A) CONSTRUCTION:

The slag pockets are essentially loose-lined boxes placed at the bottom of the downtakes to act as dust catchers, and thus reduce the choking of the checkers. The general arrangement is shown in Fig. 4, which illustrates the slag pockets on an 80-ton cold pig fixed furnace. It will be seen that the removal of

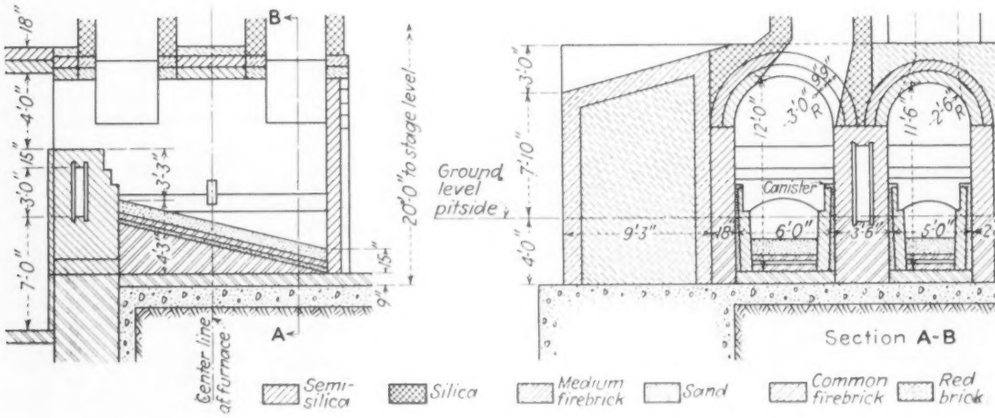


FIG. 4—Typical construction of open hearth furnace slag pocket.

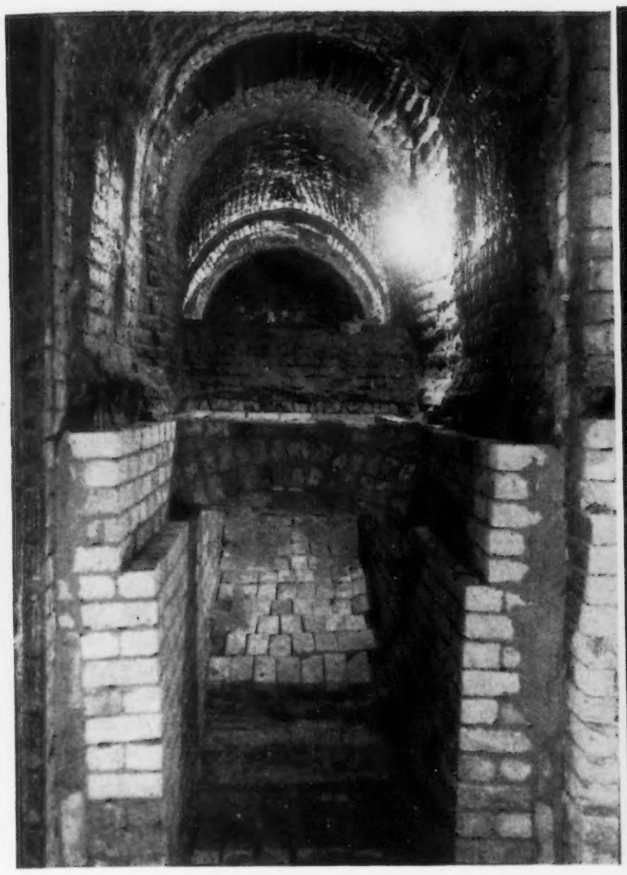


FIG. 5—Slag pocket cleaned and ready for use.

FIG. 6—Slag pocket at the end of a campaign. Note the high level of the slag.

the slag block through the wickets is facilitated by providing the slag pockets with a loose lining of brick separated from the outer brickwork by a layer of refractory sand. Figs. 5 and 6 show the appearance of the pockets at the beginning and end of a campaign of about 13 weeks.

(B) MATERIALS:

The slag pockets are constructed of second quality silica brick, generally rather soft fired (specific gravity over 2.40). The loose lining is of similar quality, while a good quality sand with not too high a sintering tendency is used for the separating layer. The slag slopes and bottom paving are built of siliceous fireclay brick or recovered silica brick, while the slag wickets are built of second quality silica brick or recovered silica brick.

The use of air cooling boxes between the gas and air slag pocket walls tends to increase their life, since it provides cooling and also prevents mixing of gas and air.

(C) LIFE AND CAUSES OF FAILURE:

After about 13 weeks the slag pockets are filled with a fused mass of slag which is a product of reaction between the dust brought over from the furnace and the silica brick in the uptakes. Unless the slag pockets are emptied at this stage increasing amounts of dust and slag will be carried forward to the checkers and the life of the latter will be considerably reduced. The analysis of the slag pocket material varies greatly according to the type of steel being made, the nature of the uptakes, etc., but the following analyses show the kind of slag that may be expected:

	Air Slag Pocket, Per Cent	Gas Slag Pocket, Per Cent
SiO_2	46.9	47.2
Total Fe	30.6	25.1
Al_2O_3	1.3	1.6
MnO	1.0	1.1
CaO	9.2	13.9
MgO	2.1	3.4
SnO_2	0.1	0.1
PbO	0.8	0.7
CuO	0.1	0.1
ZnO	2.2	1.6

It is of interest to note that the MgO content is much lower than the CaO content, which suggests that the lime charged is responsible for a good deal more of the dust than the "basic" used for fettling. The high silica content is due in part to the silica fluxed from the uptake walls, and part to the silica brick pushed into the slag pockets during repairs to the gas and air ends.

(D) LINES OF IMPROVEMENT:

(1) The removal of the slag pocket material is greatly facilitated by the use of the lazy walls but is still a rather slow and arduous process. Experiments in the United States have shown that such novel devices as the use of solid carbon dioxide placed in drill holes and then heated so as to act as a mild explosive can save both time and labor.

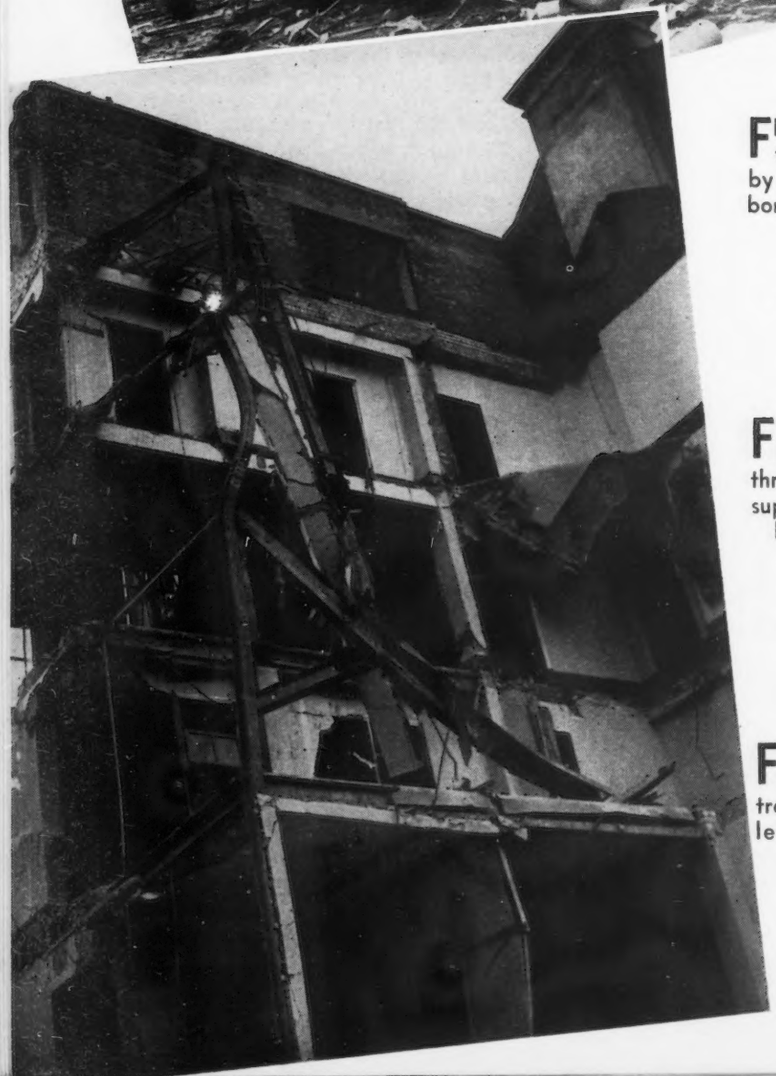
(2) The prevention of gas and air end brick falling into the slag pockets would reduce the time of filling, while with the "all-basic" furnace the product is so crumbly that it can readily be shoveled out, and even used for basic current.

Ed. Note:—Next week the author, in conclusion, presents data on checkers, the checker chamber, gas and air valves and flues, etc.

Air Attack vs. Steel

ABOVE

FIG. 1 — Structural damage by high explosive bombs and blast.



LEFT

FIG. 2 — Collapse of floors through loss of support on load bearing wall.

RIGHT

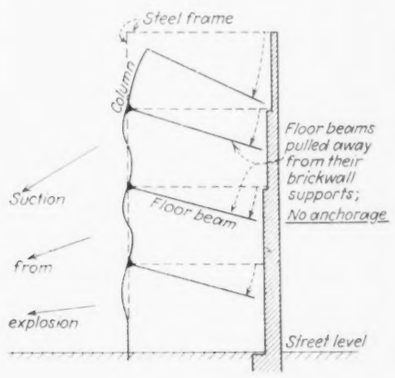
FIG. 2a — This sketch illustrates the cantilever action in Fig. 2.

TODAY London and other British cities present many grievous but instructive examples of destruction. There is ample scope for the engineer to check his knowledge of the strength of materials and his methods of design and construction, and it is already evident that these methods and their future development are being deeply influenced by recent lessons from air raid damage. In spite of their abundance, it is certainly premature to draw final conclusions and to lay down new theories and rules, and by no means should an individual observer on the spot with his limited experience feel competent to do this job.

Here are only some examples without systematic coherence, but they may give an idea of what forces and effects on structures in air war must be taken into account by the designing engineer. The following remarks refer to buildings damaged in the past nine months or so in London and other towns of the British Isles. Rolled steel was employed at all these houses, either in combination with load carrying brick walls or as riveted or bolted frames.

Even before the war it was known that generally speaking the worst bomb damage is not due to direct impact, but to the indirect effects of the explosion: (A) Blast, viz., compression and suction of the air, and (B) splinters which are flung out of the center of the explosion at tremendous velocity.

Protection of men required certain standards both for the design



Structures

By O. BONDY
Consulting Engineer, Surrey, England

—Here is recent experience with various types of framed buildings in England

of new shelters and for strengthening existing houses. The figures for loads, especially those of the horizontal forces due to blast, were taken from the results of practical tests and by the aid of assumptions, but a comparison from the publications of various countries reveals great differences in the fundamental figures. According to a French source,[1] a publication of the Home Office, London,[2] gives the following table for thicknesses of protective steel plates:

Weight of Bomb Lb.	Thickness of Mild Steel Plate Just Perforated by Penetration, Without Explosion
110	3.9 in.
220	4.7 in.
660	6.7 in.
2200	10.0 in.
4000	12.0 in.

These few figures already demonstrate what a gigantic task it would be to erect really bomb-proof shelters for millions of inhabitants of a large town. But, perhaps better than figures, some pictures will give an idea of the magnitude of the explosion forces, especially of the horizontal blast.

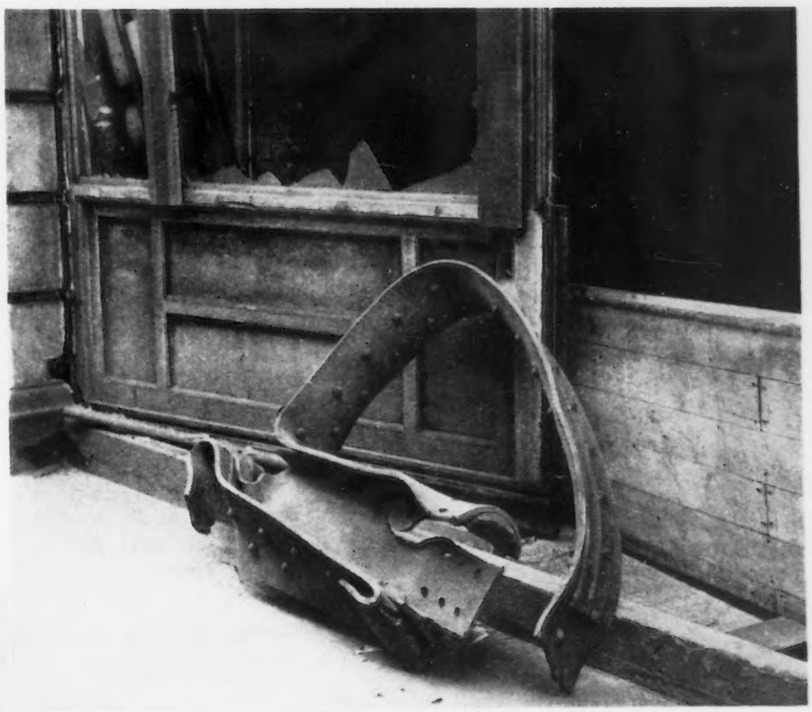


FIG. 3—Part of a riveted compound girder deformed during collapse.

FIG. 4 — Floors and windows gone—steel columns still support this building.

Fig. 1 reveals that lateral forces contributed considerably to the destruction. The walls have not simply broken down, but they were blown in and out by blast which, as is common knowledge, works in both directions, viz., in the first

FIG. 6—Internal damage at Fig. 5 to floors and panel fitting; steel frames intact.

stage from the explosion center outwards, and in the next phase in the opposite sense, and either effect can lead to the collapse of the structure. If the floor girders are supported by the walls, their collapse by blast will unavoidably result in the collapse of the floors as well. It should be, therefore, a fundamental rule for steel structures that the frames must be fit to take up lateral forces, i.e., the connections between columns and beams should be substantial enough to provide for anchorage or, betters still, for rigid frame action.

The same holds good for reinforced concrete buildings, of course, but there is hardly need to stress this point, as rigidity of the connections has ever been in the very nature of reinforced concrete construction.

Fig. 2 may give an idea of the forces which deformed the steel skeleton into such a twisted frame. The horizontal girder has lost its right-hand support on the brick wall; but as the left end kept its connection to the supporting steel column, the falling girders acted as cantilevers and caused serious distortion of the corner column (see sketch, Fig. 2a). The picture shows clearly, too, that the wall panels should be only loosely connected to the steel frame so as to give way in case of an explosion. This is a well-known rule as applied to walls and roofs of explosives factories.

Fig. 3 shows part of a curiously deformed compound girder: the riveted flange plates were completely bent back, and they even took the flanges of the reinforced steel joist with them, tearing through the web. This picture proves an important asset, viz., the excellent quality of the rolled steel; otherwise it would not have stood up to such extraordinary deformation under explosion forces. What a contrast to the brittle fractures which were typical of the Hasselt Bridge collapse in Belgium in 1938![3]

In Fig. 4 may be seen the remainder of a house balancing on two slender steel props, whereas the entire neighborhood was transformed into ruins. It was obviously good luck that the large shop windows were blown out without offering much resistance. The slim columns, not affected by the blast, are "carrying on" to bear their load. It seems that the blast worked in ground floor level; an explosion at higher level would probably have destroyed the whole building.

Figs. 5 and 6 give an example of an up-to-date steel frame building, nine stories high. Here, a medium bomb penetrated the building at about the fifth floor at an angle and exploded inside with an interesting effect: The windows and several partition walls and floors were

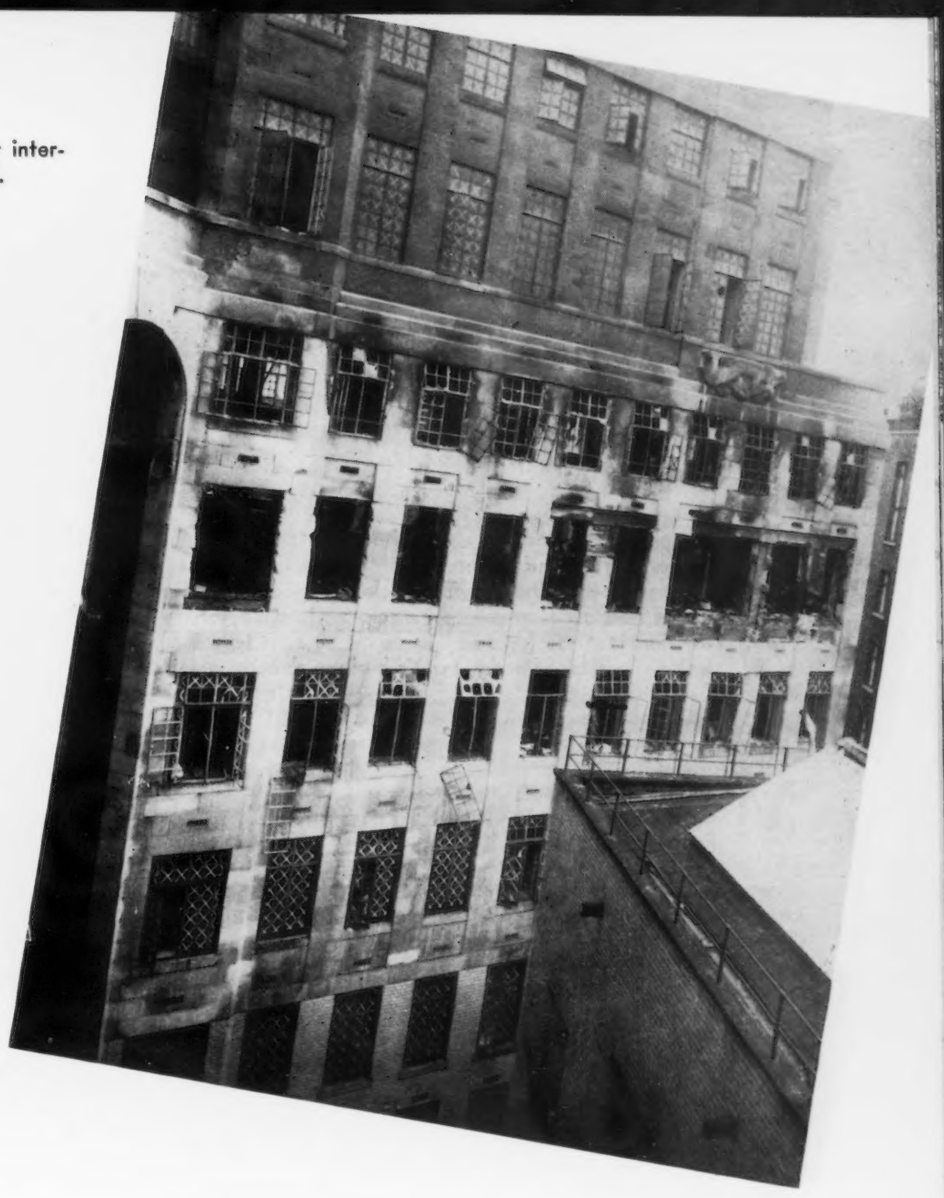


FIG. 5—Steel frame building after internal explosion at fifth floor level.

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blown out, some of the facing stones fell down, but the skeleton remained intact. The damage, though considerable, could be easily and quickly repaired. Today everything is restored and as good as before, except the beautiful stone facing, which may soon follow.

This case is typical of modern steel frame buildings under air attack, and numerous other cases confirm this experience. Modern framed structures are in many respects superior to the older types of buildings. Although designed before there were any Air Raid Precaution requirements their superiority has been clearly proved under fire, too. This will increase when the design of these buildings will take account of the new Air Raid Precaution rules. There is no question that protection against fire must be improved, since even a perfect design of steel frame is of no use if, exposed to heat, the steel loses its strength. In this respect, too, the experience gained from bomb damage on a vast scale will be turned to future progress.

References

[1] M. Bazant, "Travaux", April and May, 1937.

[2] "Structural Defence", Air Raid Precautions Handbook No. 5, issued by the Home Office, London.

[3] *Engineering News Record*, Aug. 18, 1938.

No Grain Size-Toughness Relationship

EXPERIMENTS just concluded by metallurgists at the National Bureau of Standards indicate that there is no relation between grain size and toughness of steel.

Knowing that it would be highly advantageous if the important property of toughness in steels could be correlated with some other easily ascertained characteristic, Samuel J. Rosenberg and Daniel H. Gagon made a series of notched bar tests of a medium-carbon forging steel at different degrees of heat. The tests were made so as to have different grain sizes in the specimens used.

The results show that each individual heat of a medium-carbon forging steel has an inherent resistance to impact peculiar to that particular heat, and that this impact resistance is dependent upon factors not at present recognized.

It was found that as the specimens were hot rolled no relation existed between grain size and toughness, and that all the steels were quite brittle. Normalizing—heating to 1600 deg. F. and air cooling—caused some improvement in toughness. When so treated the fine-grained steels were tougher than the coarse-grained steels.

Proper heat treatment—hardening and tempering—resulted in a marked improvement in the toughness of the steels, but in this condition there was no relation between grain size and toughness.

Thus, it is apparently not possible to correlate the effect of grain size and heat treatment with the impact-toughness of steel. However, it is known that most steels lose toughness—become brittle—quite rapidly as the temperature is decreased. The range of temperature wherein this change occurs is a reliable criterion of the relative toughness of steels; the lower the temperature at which toughness is lost, the better the steel.

20,000 Shells a Day by

IN the first part of the article which appeared last week, methods and equipment for forging 75 and 105 mm. shells at the G.M. forge plant at Lansing, Mich., were described. The current article describes the subsequent machining operations, carried on in brand new equipment, mostly of the vertical spindle type. Provision is made for carrying away by conveyor the 50 tons of chips produced a day in this high production plant.

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MACHINING of shells at General Motors' forge plant at Lansing is divided into two sections, each occupying equal floor area and practically identical as to sequence of operations, the machines differing only in size with the exception of secondary finishing operations on the shell. In the case of the 105-mm. shell these secondary operations are performed in vertical automatic lathes while the equivalent operations on the 75's are effected on horizontal automatic chucking machines. This set-up and a few minor operations like drilling and tapping a lockscrew hole and milling staking notches are the only ones performed on horizontal spindle machines. In making the layout, plant engineers had motion economy uppermost in mind and have arranged all machines so that when loaded in the work position on the machine, the shell base is 35 in. from the floor. With vertical mandrels and chucks, in the example of the 75 mm. shell it becomes a single one-arm motion to pull a shell out of the conveyor carrier bucket and drop it in place for clamping and driving. For the heavier, 105 mm. shell, two hands are needed to effect the transfer from conveyor to machine and back without taking a step or bending over. By eliminating the fatigue element in this way, worker efficiency can be maintained throughout the shift.

The sequence of machining operations on the 75 mm. shell will be described since they are largely typical for both sizes. First operation is center drilling of the closed end. This is done in a battery of six vertical centering lathes which have a number of features making them desirable for this class of work. Shells are dropped from conveyor with open end down over a mandrel which contacts the bottom of the cavity. Depth of center drilling is gaged in relation to this point as are subsequent turning operations. Clamping on the mandrel is by two sets of hydraulically expanded fingers. When loading the shell, the drill head is retracted horizontally on a cross rail by hydraulic power and the same push button used to bring the head into the work position also effects clamping of the shell. Actual feed is by hand, using rack and pinion and lever arm.

A somewhat different arrangement is used on the centering machines for the 105 mm. shell. These machines have hydraulically actuated elevating tables which in the up position are almost at conveyor height. The shell is placed on this table and when the cycle start button is pressed, the table lowers, dropping the forging over the mandrel. The arbor pins then automatically expand, work arbor commences to rotate, drill head moves over to arbor center and spindle begins to rotate. Center drilling is done manually as before. A second button is depressed to reverse cycle and raise table to discharge the shell. In both types of centering machines, the arbor has two sets of three expanding type locators which center and hold the shell at the top and bottom of the forged cavity.

In a parallel line to the centering lathes is a battery of nine vertical lathes for carrying on various rough turning operations on the 75 mm. shell. Between the two batteries is a short straight loop conveyor, No. 4, with eight-shell work carriers similar to those for conveyor No. 3. The float capacity in this instance, however, is about 1200 shells or a little over two hours' production. The nine lathes are all tooled up alike. As the close-up view of the work position shows, the tooling is conventional and similar to horizontal spindle machines, but here again loading from the conveyor is facilitated by use of the vertical mount.

Shells Turned with Carbides

These machines are fully hydraulically actuated. At the open end, the shell is chucked internally on a short stub arbor with three high speed steel grips expanded by a cone and hydraulic piston. Location endwise is from the base of the cavity and is obtained positively through the use of a locator bar with a cup end that engages a cap on top of the driver. This bar is dropped into the shell before it is pulled from the conveyor bucket. Base of shell is supported by a dead center moved downward hydraulically. All five tools are carbide tipped and cut at 300 ft. per min., using a soluble oil in-water as a coolant. Tool slides are actuated hydraulically. Feed is down. Right tool carriage, which carries three turning tools, incorporates a multiple wedge cam relief device which automatically retracts the tools away from the work when the carriage is returned upward upon completion of the cut. Top tool on the right-hand carriage rough turns the boattail on the closed end and has a combined cross feed by fixed cam plate. Except for the relief action mentioned the two other facing tools feed straight down at the rate of 0.028 in. per rev. after coming into the work at an angle.

General Motors

By FRANK J. OLIVER
Machine Tool Editor, The Iron Age

Two left-hand tools rough face open and closed ends and chamfer open end. Feed is straight in and is accomplished by a hydraulically actuated cam bar, tool saddles being fixed. These machines are special purpose in that they are geared up for one speed. Variations in spindle speeds are effected by pulley changes, however.

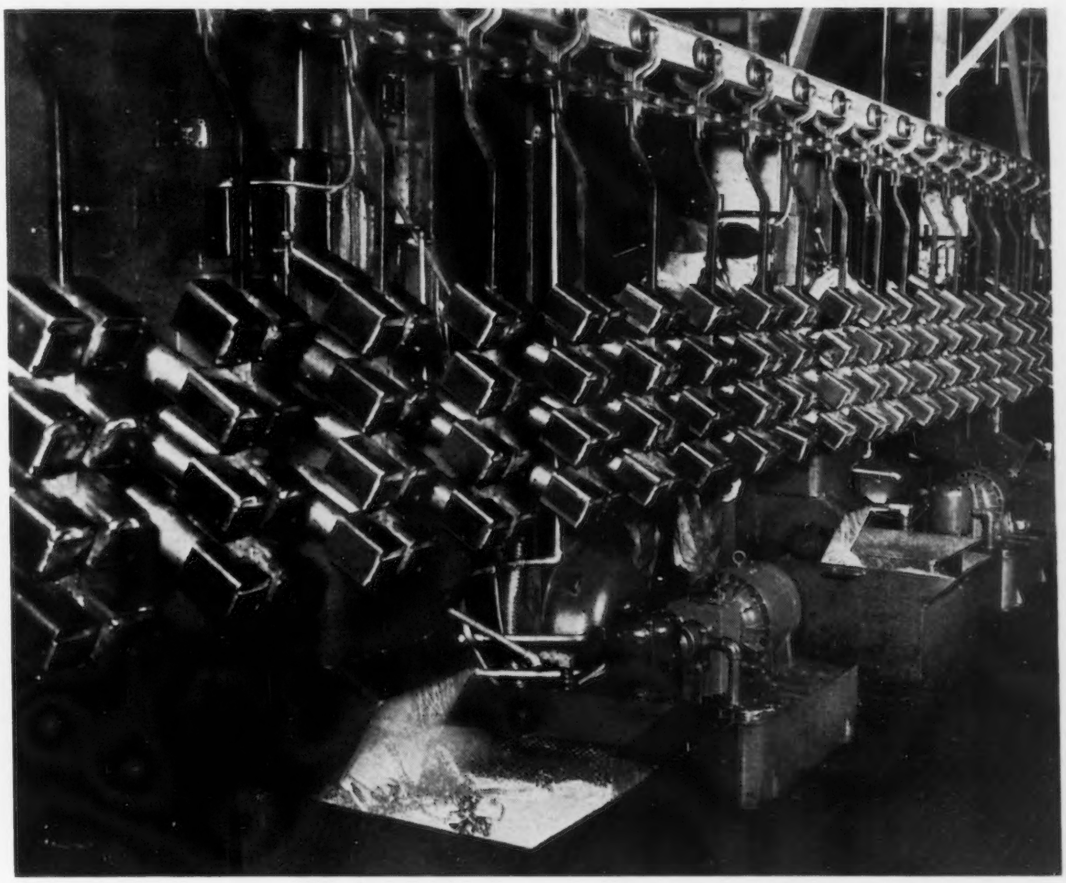
Chip Conveyor Provided

These roughing operations are the big chip producers, and a chip conveyor runs the length of these machines and others farther down the line. This chip conveyor is located in a concrete lined trench covered with sections of floor plate funneled to machine for easy accessibility. This apron conveyor discharges to a similar conveyor in a pit at right angles at the end of the line and carries the chips to a pivoted hammer type crusher for breaking up the chips before they are lifted by bucket elevator to a 50-ton storage hopper—holding a day's accumulation of chips.

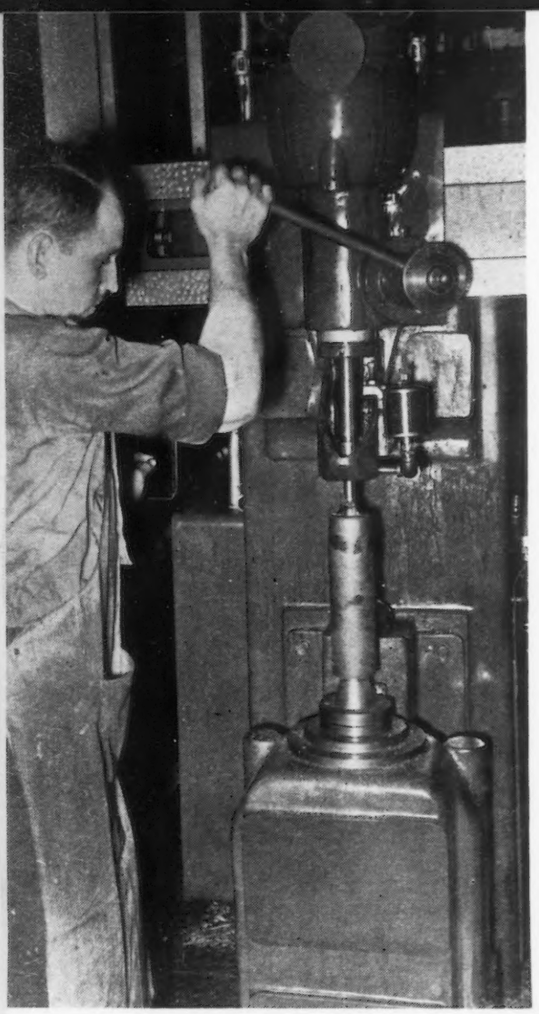
Rough turned shells are placed in conveyor No. 5 and carried, eight in a holder, to an inspection table. The nose of the open end is then formed cold in a 350-ton press, using colloidal graphite suspended in water as a die lubricant. Two of these single action mechanical presses are lined up alongside the conveyor line, while a third press is to the side as standby equipment. Shell is dropped open end up in a collet which automatically grips the work radially when the nosing die descends. At the top of the return stroke a fixed knockout bar discharges the shell into the operator's hand.

Special Rotary Lathes

Finish turning of the shell o.d. is carried on in a battery of four



THE buckets on this shell conveyor all but conceal the battery of vertical spindle lathes for the rough turning operations. Chips are discharged to the screen in the foreground and are raked out into a slat conveyor located in a trench in the floor. Access to this apron conveyor is had by lifting the floor plate.



FIRST machining operation on the sheel is centering, performed in a vertical machine with hand feed. Shell forgings are pulled out of cup holders in the conveyor at the left.

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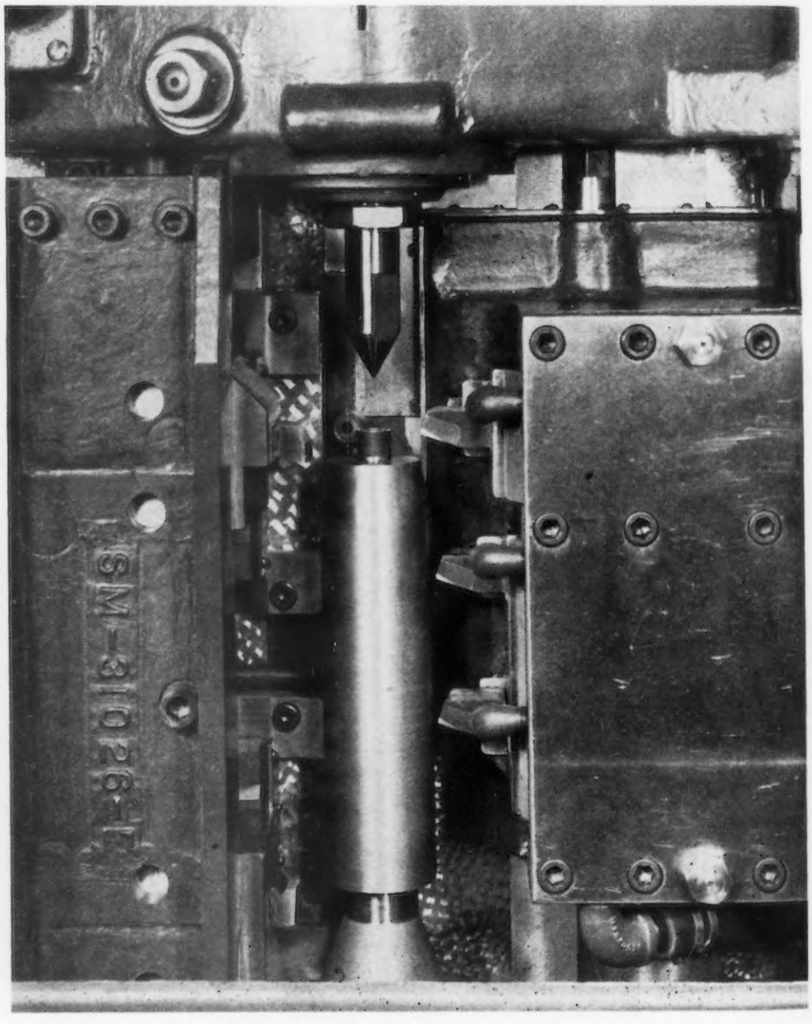
automatic multiple spindle lathes. This machine comprises what amounts to eight vertical lathes rotating as a unit about a column so that a single operator loads and unloads at one point. Unlike the rough turning machines, these units have mechanical feeds and mechanical clamping, the latter by hand spanner wrench. As originally planned, the machines were equipped with an unconventional type of rotary form cutter, which cuts on the peripheral edge and, in effect, is a cam form which when "unwound" develops the full length and contour of the shell. Because of its size, however, (11½ in. peripheral length, approximately,) it had to be made of high speed steel, and it was found that the production time of 175 shells per hr. could not be met with these tools. As finally installed, a single carbide tipped tool is used to cut the entire length of the shell o.d.

In either design, cutter axis or slide is fixed in height and the revolving work is fed upward past the cutter. Shell is loaded, open end down on a short driver which has grips which are expanded internally by manual rotation of a cam plate. Closed shell end is supported by a dead center and tailstock racked down into position and locked by hand. Spindle rotation is initiated by push button, as is the vertical feed of the heavy headstock and integral slide which is supported on large, wide ways both top and bottom. Movement in and out of the tool slide to form boattail and bourrellet is by a cam plate fixed to the machine frame. Upward feed of the work carriage is by a circular cam track fixed in the main base of the machine, the rotation of the heads about the main column providing the feed action. Upon completion of the upfeed, spindle automatically stops and operator unloads shell. In the next foot of rotation the work head is dropped to starting position by a steep part of the track cam, and loading of a fresh shell takes place as before. This arrangement obviates dragging of the tool back over the finished surface. Complete cycle is 3 min., but during this interval eight shells are machined or net time per piece is only 23 sec.

Spindle speed is varied automatically during different parts of the cycle to obtain the desired finish. For instance, the boattail on the 75 mm. job is turned at 160 r.p.m. and the feed is 0.050 in. per rev., while the bourrellet is turned at 110

CLOSE-UP of the tooling on one of the vertical automatic lathes for rough turning operations on 75 mm. shell. Turning tools are carried in the right-hand carriage and facing tools in the left, all being carbide tipped.



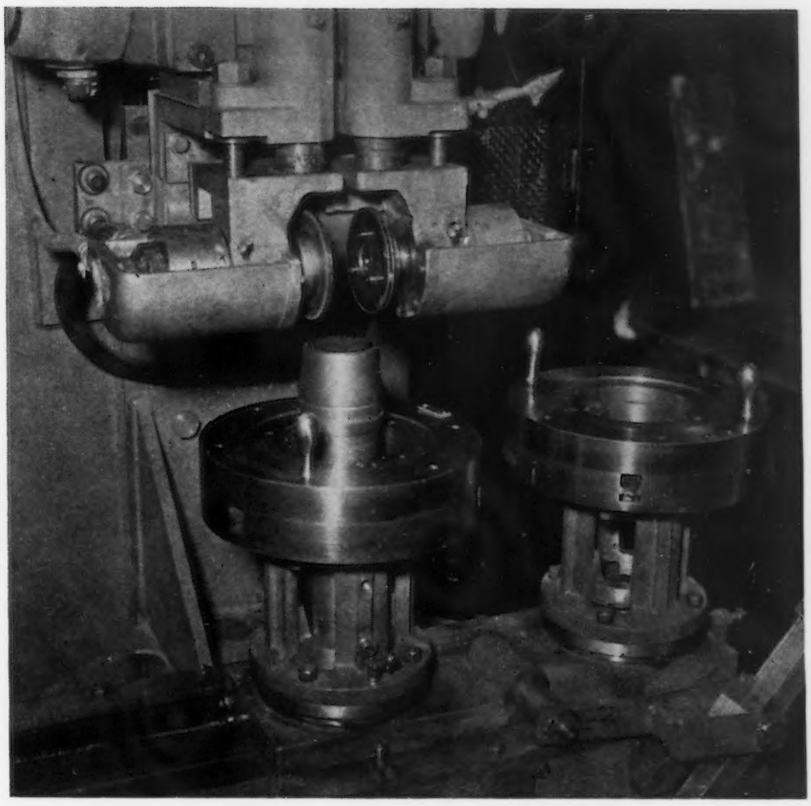
r.p.m. and the feed is cut down to 0.025 to 0.030 in. per rev.

There are four of these eight spindle machines in the line and they are served by conveyor No. 5, which originally took the shell from the rough turners.

Chucking Work

Drilling and tapping of the 5/16-in. 18th setscrew hole is done in a simple cradle fixture which is shifted between drilling and tapping positions in a two-spindle drill stand, of which there are five. Conveyor No. 5 takes shells to these machines and conveyor No. 6 takes them over to a battery of nine eight-spindle chucking machines. The set-ups on these machines are the same as at the Frankford Arsenal. Machines are double indexing type with alternate stations tooled to do operations on the base and open end. For the former operations, chucking by hydraulic power is done at station No. 8, rough facing of the base is done at station No. 2 with a carbide tool, the band seat is formed with a circular form tool and the lug removed by an end mill in station No. 4. In station No. 6 the base is finish faced the correct distance from the base cavity against which the shell is located in the collet chuck. The shell is then reversed and chucked in station No. 1. Rough boring and rough facing of the open end takes place in station No. 3; reaming, finish facing and chamfering takes place in station No. 5, and threading is done in station No. 7 with a collapsible tap. Spindles rotate at 144 r.p.m. giving a cutting speed of 110 ft. per min. on the 2.929-in. diameter. Production is 80 shells an hr.

Milling of the five staking notches in the nose is a conventional operation performed in a hand feed miller with special hand indexing fixture. There are four of these hand millers, although three could keep up with the bogey of 600 75-mm. shells an hour. Shells are pulled off conveyor No. 6 after they have gone through the automatic chuckers, and after the milling operation they are placed on conveyor No. 7, which carries the shell past a battery of three band seat knurling machines and then past five hydraulic banding presses. Both these machines are vertical spindle machines. In the knurling machines, the wheel which knurls the upraised band ridges is driven about a fixed axis by a worm and



DOUBLE fixture for holding and rotating the shell while a 22-gage disk is seam welded to the base of the shell. One fixture is loaded, while the other is in the welding position.

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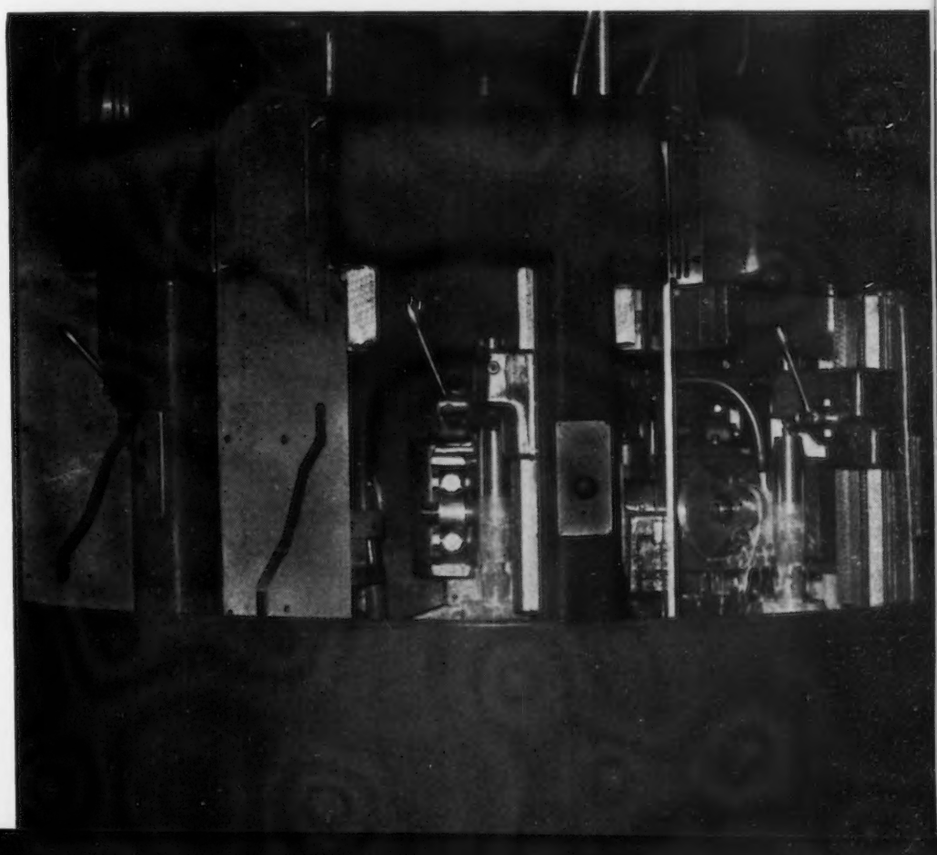
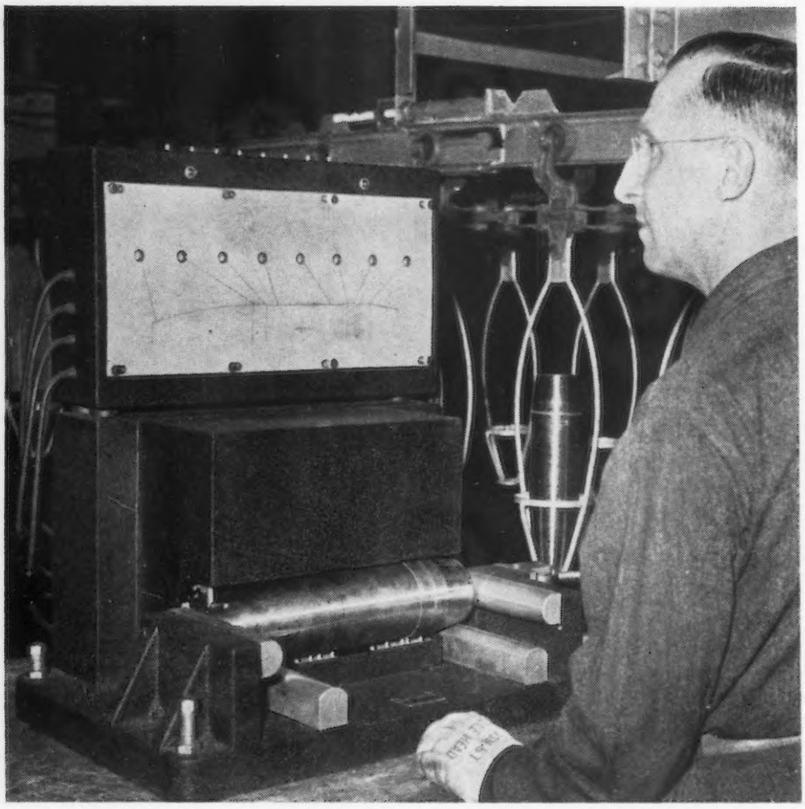
MULTIPLE spindle vertical lathes for finish turning o.d. of shell after open end has been nosed-in in a press.





ABOVE

EIGHT diameters on the shell are checked at once by this electric gage which employs colored light signals to indicate on-size, oversize or undersize.

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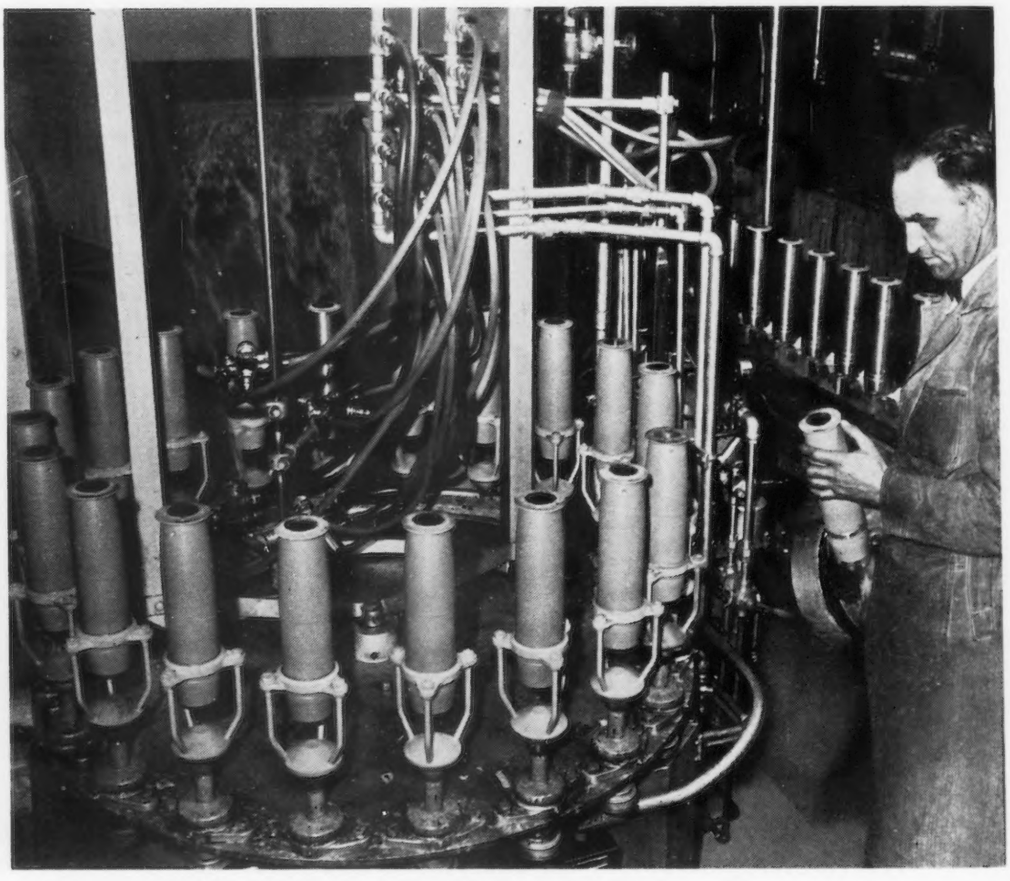
RIGHT

AUTOMATIC spray coating of shell and packing immediately thereafter in cartons is made possible by using a lacquer that dries hard in about 40 sec.



wheel and the shell is pressed against it by a pair of hardened pressure rolls actuated through an air cylinder and bell crank.

Banding in a tire setter with so-called rotating band is accomplished by forcing the brass ring (cut from tubing) into place through the medium of six dies backed up by hydraulic cylinders. Pressure up to 900 lb. gage is applied three times, the shell being turned 15-20 deg. between pressings. This insures that the band completely fills the groove and that there is no possibility of slippage in transmitting the torque from the rifling grooves in the gun barrel when the projectile is fired.

Machining of the rotating band o.d. and chamfering both edges is performed in a battery of six single-spindle vertical lathes, equipped with carbide tools cutting at close to 800 ft. per min. These machines have screw feeds, with tool infeed governed by a fixed cam groove. Work is supported in a serrated ring and clamped from above by air.

Last operation on the shell prior to final inspection is to seam weld

a base reinforcing plate, consisting of a disk of No. 22 U.S. gage SAE 1015 steel. Five special 50-kw. welders are used for this work. Shells are loaded, closed end up, in a pot type chuck on a sliding carriage which has two such chucks. While one is under the welder, the second is being loaded. The two welding wheels are brought into contact with the opposite diameters of the disk by an air operated plunger and welding current passes from one wheel through the work and up the second wheel. Rotation of the chuck and hence the shell is by motor driving through a bevel gear and manually engaged clutch in the welding position.

Work is taken from the band turners on conveyor No. 8, and after passing the battery of welders, is carried directly through a steam and alkali washer and dryer. This is the last monorail conveyor in the 75 mm. line. When the cleaned shells are pulled off this line, they are inspected at benches for diameters on electric gages, and for the tapped nose, on thread checkers. Setscrews are assembled by hand, then the shell is engraved above the band in a roll marking machine.

Final operation before packing in cartons is to spray-paint the shell to prevent rusting in storage. This is done automatically in a rotary table machine which has an external and internal painting position on the rotary table. Interior painting is done by an extension nozzle which is lowered into position when the shell holder reaches this position and is revolving. The table then indexes to the next position, and with the shell still revolving, a battery of guns coat the outside. A lacquer that dries hard in about 40 sec. is used so that the product can be immediately pulled off the spindles ready for packing in cartons, six to a case.

The sequence of operations on the 105 mm. shell is similar to that for the 75 mm. shell, although the machine layout is quite dissimilar. Machines are grouped differently in smaller numbers, and only five conveyors are needed instead of six. Vertical eight-spindle automatic lathes do the second operation work on the shell nose and base end, including grooving, in place of the chuckers used for the corresponding operations on the 75 mm. shell. The big production job is the 75's, the hourly machine rate being 600 as against 250 an hr. of the 105's.

Pitch Coke for Chill Castings

INTRODUCING what is claimed to be a new process for manufacturing chill castings, K. Knehans and N. Berndt, in *Stahl und Eisen*, translated by *The Iron and Coal Trades Review*, call attention to the assumption that in preparing the melting charges for making these castings, large proportions of special pig irons are essential. High carbon is also important, since the hardness of the casting is a direct function of the carbon content. This carbon is introduced through the medium of high-carbon special irons which the German industry has in the past imported from Great Britain; in addition, it is not practicable to use a high proportion of broken castings in the charges owing to their high sulphur content and low carbon.

The authors suggest that these two limitations can be overcome by achieving the desired carbon content, not by way of the components in the charge proper, but by using a special fuel for melting, that is, but substituting pitch coke for foundry coke in the cupola.

Pitch coke, a by-product of coal carbonization, is stated to be much harder and denser than ordinary foundry coke, and has higher resistance to abrasion. Its true specific gravity is between 1.9 and 2.0; it has less than 0.8 per cent volatiles and also a low ash, barely more than 0.3 per cent, as compared with 9 or 10 per cent with foundry coke. It has the very high carbon content of 98 per cent, and compared with foundry coke has a very low sulphur content, at most 0.5 per cent, as compared with 1.0 per cent in foundry coke.

Investigations of the equivalence of pitch coke and foundry coke in a series of tests made in a cupola 39 in. in internal diameter and 8 tons per hr. capacity were made by the authors. Details of the charges are given in Table I; these melts were analyzed, the Shore hardness was determined, and the texture was examined on samples taken and prepared by a standard method. Results of hardness measurements and analyses, given in Table II, indicate that chill castings made with pitch coke are equivalent to those made with ordinary foundry coke; there is a slight increase in carbon content with pitch coke, although total carbon in the mixtures with pitch coke was lower than in test A with foundry coke alone. The hardness values were satisfactory, and no differences could be detected in the fine structures when etched with picric acid and the sections polished.

These results being successful, pitch coke was then substituted for foundry coke on a commercial scale. The advantages of this substitution are claimed to be the complete displacement of special irons and the ability to increase the proportion of broken castings in the mixture up to 70 per cent. The authors claim that ingot molds of satisfactory durability can be made from a charge composed exclusively of broken castings when using pitch coke, with a consequent heavy saving in hematite.

TABLE I—Composition of Trial Melts

	A Per Cent	B Per Cent	C Per Cent
Total carbon in charge	3.60	3.40	3.35
Mixture results:			
Special iron I	36	...	...
Special iron II	17	...	...
Thomas pig	13	15	15
Hematite	...	30	10
Steel scrap	5	5	5
Broken chill castings	25	50	70
Fluxes	—— remainder ——		
Fuel:			
Foundry coke	12	9	9
Pitch coke	...	3	3

TABLE II—Composition and Hardness of Test Melts

Analysis	A Per Cent	B* Per Cent	C* Per Cent
Carbon	3.46	3.76	3.64
Silicon	0.47	0.51	0.42
Manganese	0.87	0.99	0.88
Phosphorus	0.45	0.55	0.59
Sulphur	0.089	0.077	0.083
Average Shore hardness at quenched edge	67	72	73

*Figures for all elements are averages of three melts in case of B and of two melts in case of C.

How to Choose E

—In the second and concluding part of the article, which began in last week's issue, the author discusses the most efficient arrangements for multiple operator motor-generator sets, having individual resistor controls at each welding station. This type of equipment has assumed a primary place in welded ship construction within the recent past.

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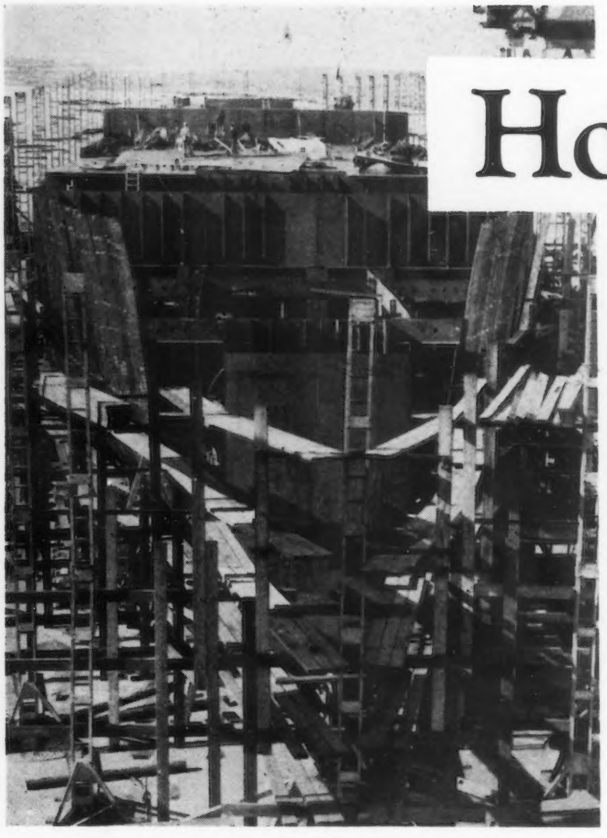

S. S. AFRICAN COMET, first all-welded passenger liner, under construction at the Ingalls Shipbuilding yard. Constant-potential welding sets, located under the forepart of the ways to save deck space, furnish reversed-polarity welding current for the majority of the work. A few single operator sets on the decks supply welding current of either polarity, thus giving maximum flexibility.

BEFORE the advent of specially developed single operator motor-generator sets for arc welding service, multiple operator constant-potential welding systems were very widely used. Fig. 6 shows schematically a typical layout of equipment required for a welding system of this type. A motor-generator set, with suitable control panels for the motor and the generator, supplies constant voltage, direct current, usually at 60 or 70 volts, to a welding bus.

At various points convenient to the welding locations, individual resistor stations are connected to the bus and through them welding current, regulated to suit the needs of the operator, is supplied to the individual arcs. The number of stations which may be supplied by one motor-generator set is dependent on the rating of the generator, the current drawn by each arc, and the duty factor at which the system is operated. In large motor-generator sets, rated at 1000 or 1500 amp., which are being purchased today, the motor-generator set efficiency will be in the neighborhood of 80 per cent, while the electrical efficiency of the resistor station required for each arc will be in the neighborhod of 50 per cent. Thus the overall efficiency of one individual welding circuit will be approximately 40 per cent. Care should be taken, however, not to compare this efficiency figure with that of other types of equipment without taking into account other possible economic advantages of the system.

Economic Advantages

These economic advantages are the chief reasons for the selection of this type of welding system, since it offers no technical advantages over single-operator welding sets. By the use of the multiple operator constant-potential system, however, it is possible to take advantage of the diversity inherent in a large number of welding arcs, and the low duty factor (or ratio of arc time to total time) which is characteristic of any one individual arc on some classes of work. Maximum benefits can best be realized where large numbers of welders are working in a relatively confined space, and this is the reason why the trend has been toward large units in multiple operator motor-generator sets.

Taking advantage of the diversity and duty factor permits a reduction in the capital investment in the motor-generator sets required to supply welding power from a.c. or d.c. distribution circuits. For example, as many as 32 welders, each using 150 amp., may be served by a single 1500 amp. multiple operator motor-generator set, where the duty factor is 25 per cent, as is frequently the case. Although the total connected load is 4800 amp., the average current drawn will be only 1200 amp., because on a 25 per cent duty cycle, only one-quarter of the welders, on the average, will be actually maintaining their arcs at any one instant. (These motor-generator sets are rated at the current which they will carry for one hour. In applying them so as to make full use of the diversity factor and duty factor, their continuous capacity should be used. This may safely be taken as 80 per cent of their 1-hr. rating.)

A further advantage is gained in

D.C. Arc Welding Equipment

By R. F. WYER
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the elimination of no-load losses. If the 32 operators referred to above were supplied by individual single operator welders, 24 of them, on the average, would be running idle and consuming power without delivering any useful output. With the multiple operator system properly laid out, the motor-generator sets will be operating at or near their continuous load capacity a very large proportion of the time. This means that no-load losses are eliminated, and a consequent saving in power realized.

Where very large amounts of welding power are required, necessitating the use of more than one constant-potential generator, they are usually arranged for operation in parallel, feeding into the same welding current bus system. Thus further advantage can be taken of the diversity factor to even out the load on each machine. With such an arrangement, one or more of the units can be disconnected from the welding bus and shut down when the total average load, as indicated on the control panel ammeters, is low enough to be handled by the remaining units.

Maintenance is Less

Another advantage in the use of the multiple operator system is the reduction in maintenance required. Only one rotating machine, in the case cited above, does the work which would require 32 rotating machines in a single operator layout.

In some installations, the question of primary power for the driving motor is of particular importance. For safety reasons it is desirable to connect single operator welders to 220 or 440-volt power lines. If these are not already available, it may be cheaper to connect a single, multiple operator motor-generator set to an existing 2300-volt circuit, or even to run a 2300-volt branch circuit to the required location, than to put in a 440-volt distribution system. Furthermore, it is frequently advisable to drive the generator by a synchronous motor to obtain power-factor correction and improve voltage regulation. With the multiple operator equipment, this can be done at reasonable cost, without sacrifice of welding performance and without complicating the equipment.

The space factor is sometimes a very important consideration, as in shipyards where space aboard or alongside the ship is extremely valuable. With the multiple operator layout, the motor-generator set with its control may be located out of the way, and the individual resistor stations, being small and capable of operating with very long leads, will require a minimum of usable space.

Disadvantages Cited

Balanced against the advantages outlined above, are some disadvantages inherent in the distribution of power at low voltage. Extremely

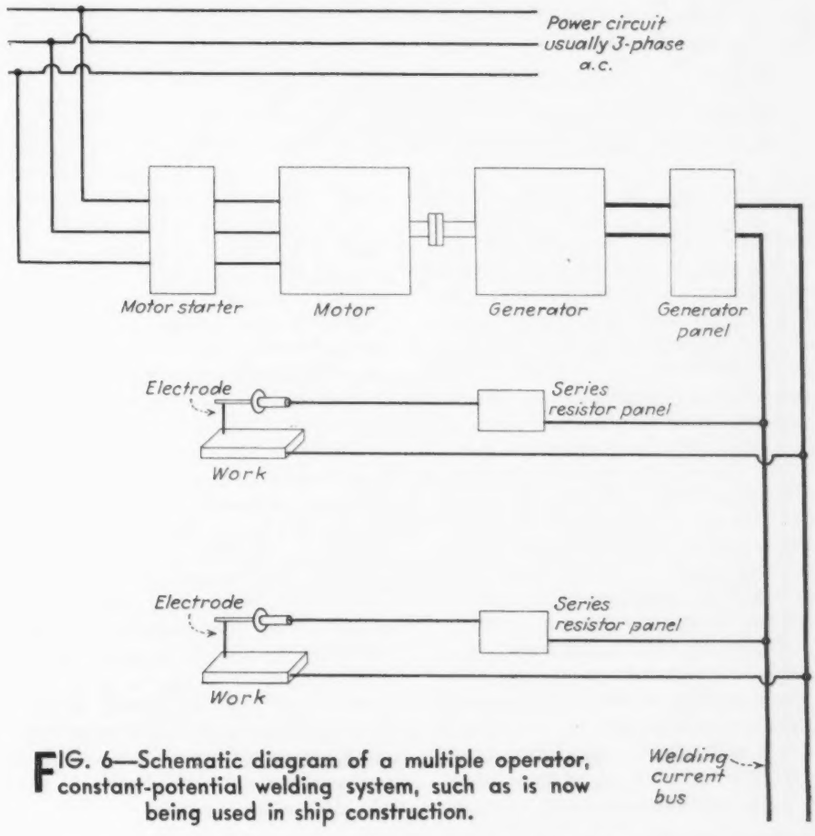

FIG. 6—Schematic diagram of a multiple operator, constant-potential welding system, such as is now being used in ship construction.

heavy copper conductors are required to distribute the welding power to the point of use. The usual practice is to run heavy bus bars or cables the full length of the welding area, preferably with the motor-generator set located about midway along the bus. To the bus are connected at intervals a number of take-offs or taps, to which one or more individual welding resistor stations may be connected by flexible cable. Since the bus is fixed in position, heavy welding cable must be run the entire distance between the take-off and point of work, and as a consequence, long welding cables are usually encountered where multiple operator welding systems are employed. While at first glance, the cost of the conductors needed might seem excessive, this low-voltage, high-current d.c. distribution requires relatively inexpensive insulation.

While it is difficult to generalize on this matter, it is probable that the first cost of the copper and insulation required to distribute power from the motor-generator set to the points of use is not very much different from the cost of copper and heavier insulation required to distribute primary power at higher voltage to a large number of single operator welders, and welding current from them to the arcs.

Although some of the factors favoring the multiple operator system are difficult to evaluate economically, a cost analysis should certainly take into account the first cost of equipment, including individual resistor stations, the number of operators to be employed, the average current required per operator, and the welding duty factor which can be obtained. Included also must be the cost of power, cost of distribution, and possible economies resulting from power-factor correction. Common practice and good judgment dictate the use of a lower depreciation for the large, heavy motor-generator set and relatively indestructible individual welding resistor stations than for single operator sets. A typical cost analysis, based on the 32-operator layout mentioned before is shown below:

Assuming 32 operators, each welding with 150 amp. and a 25-volt arc, at a duty factor of 25 per cent, the power factor and cost of power and depreciation will be approximately as follows:

Power Consumption: An induction motor-driven multiple operator 60-volt constant-potential welding set has an efficiency of approximately 80 per cent. The power output is 1200 amp. times 60 volts, or 72 kw. Dividing by 0.8 efficiency gives a power input of 90 kw.

Eight single operator 200-amp. welders, operated at 150 amp., 25 volts, will have an output of 30 kw. Dividing this by 50 per cent efficiency gives an input of 60 kw. To this must be added the power consumed by 24 sets running but not loaded, or $24 \times 1.5 = 36$ kw. Total 96 kw.

Power Factors: The multiple operator set has a power factor of approximately 90 per cent, or total demand of 100 kva.

In figuring the power factor of the single operator sets, the input of the idling sets and the loaded sets must be added vectorially. Eight sets running at 150 amp., 25 volts, and 24 sets operating at no load will have a combined power factor of approximately 50 per cent, or a demand of 192 kva.

Depreciation: The total cost of a multiple operator installation will vary with local conditions. The present cost of equipment, including motor-generator set, control, and resistors will approximate $7,500. Figuring depreciation at 5 per cent, yearly depreciation is $375.

The cost of 32 single operator 200-amp. heavy-duty stationary welders will be approximately $12,000. Figuring depreciation at 10 per cent, the annual depreciation charge will be $1,200.

If high speed, low-priced single operator welders are used, the first cost will be only approximately $8,000. Btu depreciation undoubtedly should be estimated higher, so that the annual charge will be approximately the same as for heavy-duty sets.

It should be noted that the analysis above is based on assumed conditions which are favorable to the selection of the constant-potential system. With duty factors of 50 or 60 per cent, and particularly where fewer operators are concentrated in a small area, the power consumption and depreciation figures will be very different. In general, high duty factor and the desirability of extreme flexibility in equipment layout will favor the use of single operator sets.

The welding foreman's attention should be given to a number of features of this welding system. One of the most important is the lack of flexibility in the choice of polarity. In places where multiple operator constant-potential systems are applicable, it is usual practice to use welding current return circuits or work leads which are common to all the welding operators, and usually grounded. This means that all the arcs must be worked with the same polarity, either straight or reversed. Since the majority of flat-position electrodes operate on straight polarity, while the high-quality all-position rods require reversed polarity, this factor may hamper the choice of electrodes.

Trend to 1500-amp. Sets

The selection of specific constant-potential motor-generator equipment will be based mainly on rating and type of driving motors, and on details of the motor and generator control equipment, rather than on welding considerations. Several years ago, constant-potential sets were purchased in ratings of 500, 750, 1000 and 1500 amp., but the recent trend is to purchase the 1500-amp. size. This is because the benefits of the multiple-operator system depend on the concentration of capacity which permits utilization of load diversity and low duty factor. In general, the larger the installation, the more advantage can be taken of these factors, and in large installations, there is no advantage in a considerable number of small machines. As far as first cost is concerned, the advantage is with the large machine, and the reduced maintenance and installation expense with a few large machines is obvious.

Driving motors for multiple operator generators may be induction, synchronous, or d.c. units. The choice of a.c. or d.c. will be dictated by the availability of one current or the other; where both are available a.c. is usually preferable for reasons of cost and simplicity. The choice between induction and synchronous motors must be based on studies of plant power factor. Excitation, supplied from the welding generator, may be selected to provide unity or 0.8 leading power factor operation, the latter providing leading reactive kva. for the correction of lagging power factor of other plant loads. When considerable load in induction motors is already connected, the extra ex-

pense of synchronous motor drive may be a very good investment because of the reduction in power factor penalties or demand charges by the power company.

Selection of Controls

The selection of control equipment for multiple operator sets has been simplified by virtual standardization of the control offered by manufacturers. For motor control, standard starters are used with optional additional features to give disconnecting means and short-circuit protection. Particular attention should be paid to the control enclosure; unless the control is located where it is completely protected from the weather, weather-resisting enclosing cases should be specified. Both motor and generator control panels are normally wall or floor-mounted, but can be mounted on extensions of the motor-generator base to make the entire unit semi-portable. Typical construction of the kind is illustrated in Fig. 7.

Generator control is available for separate operation of individual generators, or with additional devices to permit parallel operation of two or more generators. Care should be taken that control panels include the necessary devices where parallel operation is contemplated at the time of installation or later.

Differences in performance of multiple operator constant-potential generators involve electrical rather than welding performance. The instantaneous load changes on the multiple operator equipment are small compared to its rating due to the diversity of the load, and low reactance (small time constant) is inherent in the multiple operator generator, so that the transient or dynamic characteristic is negligible as a factor in welding performance.

The efficiency of multiple operator motor-generator sets is probably not as important a factor as in other large (90 to 100 kw.) motor-generator sets, owing to the low efficiency of the circuits which it supplies. On the other hand, while the low efficiency characteristic of individual resistance controlled welding circuits is inherent in the system, every point gained in efficiency still represents a reduction in power consumption of approximately 1 kw.-hr. per hr.

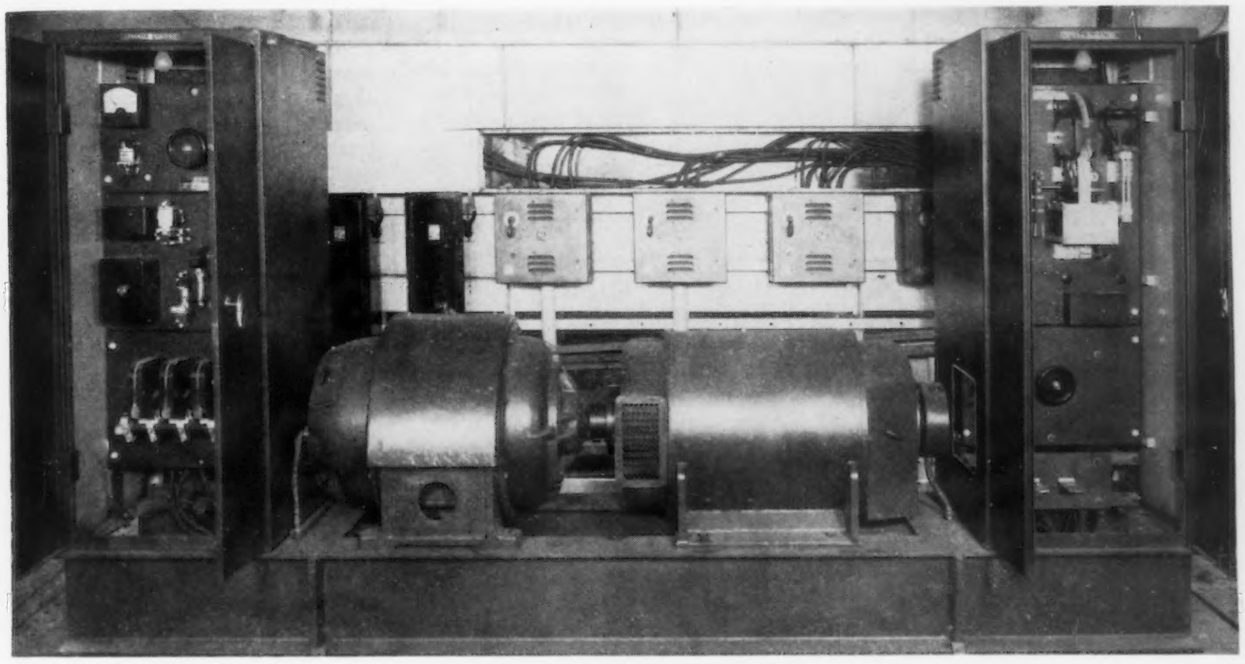

FIG. 7—Typical 1500-amp. constant-potential arc welding motor-generator set, with motor and generator control panels mounted on a single base. The apparatus is shown installed in a shipyard. Three such units, operated in parallel, will accommodate as many as 120 welding operators.

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Operation in Parallel

Operation in parallel with other similar units, with proper division of load between sets, is an important feature of many multiple operator installations. One method of obtaining stable operation and division of load within close limits (5 per cent from ¼ load to 1¼ load) is illustrated diagrammatically in Fig. 8. Both cumulative and differentially compounding series fields are employed, with the cumulative field predominating by a half turn or so. Any tendency for a machine to take too much load produces an increase in voltage across its cumulative winding, causing a circulating current to flow through the equalizer bus, thus aiding the cumulative field of the other machines, weakening its own field and tending to again equalize the load.

In selecting and specifying individual resistor stations, attention must be given to the voltage drop across the resistors, as well as to their current capacity. The design of these units is based on the use of resistors in parallel connection, as illustrated in Fig. 9. Regardless of the current adjustment of the unit, the voltage across each resistor in the circuit must be the same as that across all the others. This voltage drop must absorb the difference between the constant-potential bus voltage and the voltage drop in the arc and the welding leads. The usual designs are based on resistor voltages of 30 to 35 volts, for operation on 60 and 70-volt constant-potential circuits, respectively.

It will be seen that it is quite possible to overload resistor stations

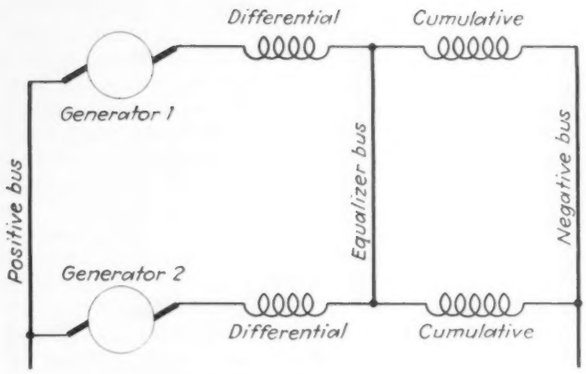


FIG. 8—Schematic diagram showing connections of differential and cumulative series fields of two multiple operator arc welding generators operatin parallel.

by the use of unusually short leads and low arc voltages, and this should be guarded against by the selection of resistor stations designed for higher voltage drop. With a unit designed for 60-volt supply and 30-volt load, if the total of arc voltage and lead drop is only 25 volts, then the voltage drop across the resistors must be 35 volts. Instead of passing, say, 200 amp. as indicated by the switch nameplates, the unit will pass about 233 amp. This means that the unit is dissipating almost 40 per cent more energy than it was designed for, and consequently it will run unusually hot. Sufficient leeway is provided in these designs to take care of normal variations in lead voltage drop, so that no undue restriction is placed on their operating conditions. The necessity of considering voltage as well as current rating, however, should not be overlooked.

The usual individual resistor stations provide current adjustment in steps of 10 or 15 amp. Minor adjustments in current can also be obtained by varying the welding lead lengths, since, as noted above, the currents marked on the switch nameplates will flow only when rated terminal voltage exists across the terminals. By increasing the lead lengths, less current can be obtained, and by using shorter, heavier leads, more current will flow.

A recent development, designed primarily for easy portability, is a light-weight resistor station for use in series with a standard resistor station. The two resistor panels divide the necessary voltage drop between them, and at the higher currents of their range (75 to 200 amp.), the majority of the voltage appears across the standard resistor. Thus the special portable unit can be unusually small and light in weight, since it needs to dissipate only a minor portion of the resistor losses. Such an arrangement can also be used to secure particularly close current control because, although the stops of the portable unit may be 10 amp. or more, the standard resistor may have its resistance varied to give in-between currents. Normally the circuit is operated with maximum current setting on the standard unit.

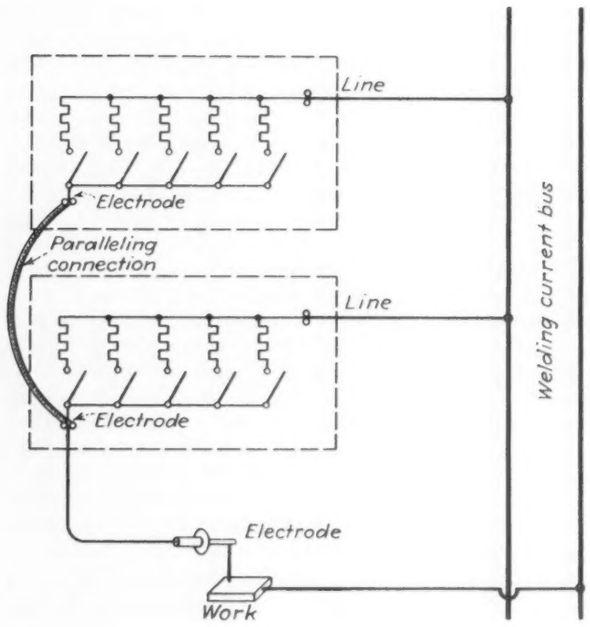


FIG. 9—Parallel resistor connection for high current welding stations.

Use of Reactors

There has been considerable discussion as to the desirability of incorporating reactors into individual resistor stations. This has been standard practice for years, but the almost universal adoption of inherently stable, shielded arc electrodes has materially altered the need for reactance in the circuit. From the evidence already accumulated, it is safe to say that at least in most installations, a reactor is unnecessary. In tests using shielded arc electrodes, in regular production welding, it has been impossible for trained operators to tell whether a reactor was in or out of the welding circuit.

For unusually high current requirements, two or more individual resistor stations may be operated in parallel simply by connecting a bus or cable between their electrode lead terminals. The total welding current which will then be drawn at rated terminal voltage will be the sum of the currents indicated by the ammeters or switch nameplates on the individual units. There is no necessity for maintaining an equal division of load between the units.

From the operating point of view, there is little difference between constant-potential multiple operator welding systems. Although it is sometimes expected that interference between arcs will be observed, this is not the case with properly installed systems. The only possible source of interference between arcs would be a change in the voltage of the bus with changes in the load on the bus, due either to poor voltage regulation of the generator or to excessive voltage drop in the welding current bus. These two causes are avoided in properly engineered installations (and installations as large as constant-potential multiple operator systems are almost invariably well engineered) by using generators which give steady voltage, and by

using bus bars of sufficient size and properly distributed to prevent noticeable voltage loss. Added to this is the fact that the current drawn by any one operator is a small fraction of the total capacity of the system. It is as unlikely that interference between arcs would be noticeable as that two water faucets tapped into a 6-in. main would interfere with one another.

The length of welding lead which can be used with constant-potential multiple operator welding systems is practically unlimited, except at the very highest currents. The reason for this is that the only effect of increased lead length is to increase the electrical resistance of the welding circuit. It is, therefore, extremely easy to compensate for it by merely reducing the resistance of the resistor panel correspondingly, and this is done by closing another switch on the control panel. To put it another way, the increased lead length cuts down the current output, and is compensated for by cutting in another section of the resistor control panel to increase the current again. This has no effect whatever on the operating characteristics of the arc. It has no effect on the possibility of interference between arcs, either, because only the individual circuit used by one particular welding operator is changed, and this does not affect any of the conditions in the welding motor-generator set or in the distribution buses.

Series Resistor Units

The series resistor unit, operated from an existing source of d.c. energy, is the simplest form of welding unit. Except for its rating and the fact that it is operated from relatively high voltage d.c. supply lines, it is nearly the same as the individual resistor stations used with constant-potential multiple operator welding systems. It serves merely as a control unit or circuit stabilizer, like the "ballast resistor" used on d.c. arc lights. Its advantages are low cost, simplicity, and ready portability. For most applications, however, these advantages are overbalanced by its very low efficiency and, except on unusually low-voltage d.c. circuits, the hazard of electrical shock. The higher the voltage of the power circuit, the more important both these items become.

Management should be mindful that the efficiency of the series resistor circuit is equal to the ratio of the arc voltage to the line voltage. With arc voltages ranging from 25 to 40 volts, the efficiency will be from 10 to 15 per cent on a 250-volt circuit. When the arc is broken, moreover, full line voltage appears between electrode and work, whereas commonly accepted safety rules permit no more than 100 volts at any time. In spite of these considerations, units of this type are in use, principally where d.c. power is cheap, and where the welding units are used only occasionally. The only common application is on trolley circuits on street railway and mine properties.

of overloading existing power lines, and to the necessity of providing adequate distribution of copper and large enough fuses to prevent interruptions to service.

Another point worth considering is the complication involved in changing the polarity of the electrode in those cases where the power circuit is already grounded on one side.

From the welding operator's point of view, the simple resistor station operated from a shop power circuit offers no technical difficulties. The arc stability is excellent, and unless unusually high power

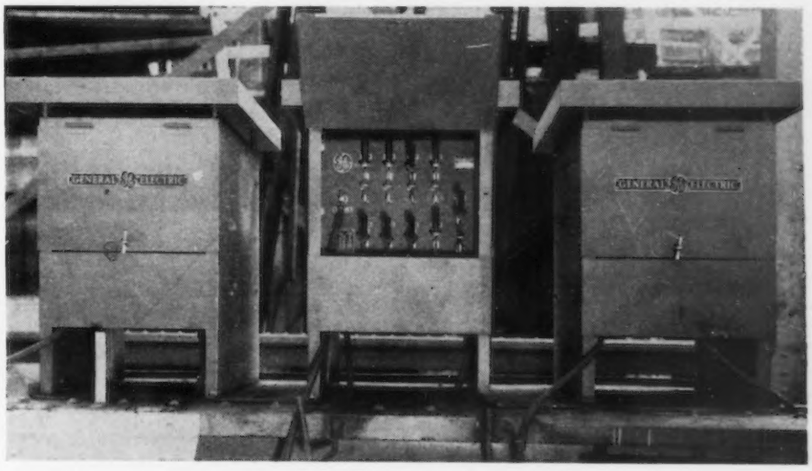


FIG. 10—Three drip-proof current regulating resistor stations installed on a shipway. Each provides current adjustment for two welding operators, the power being supplied by constant-potential motor-generator sets located in another part of the shipyard.

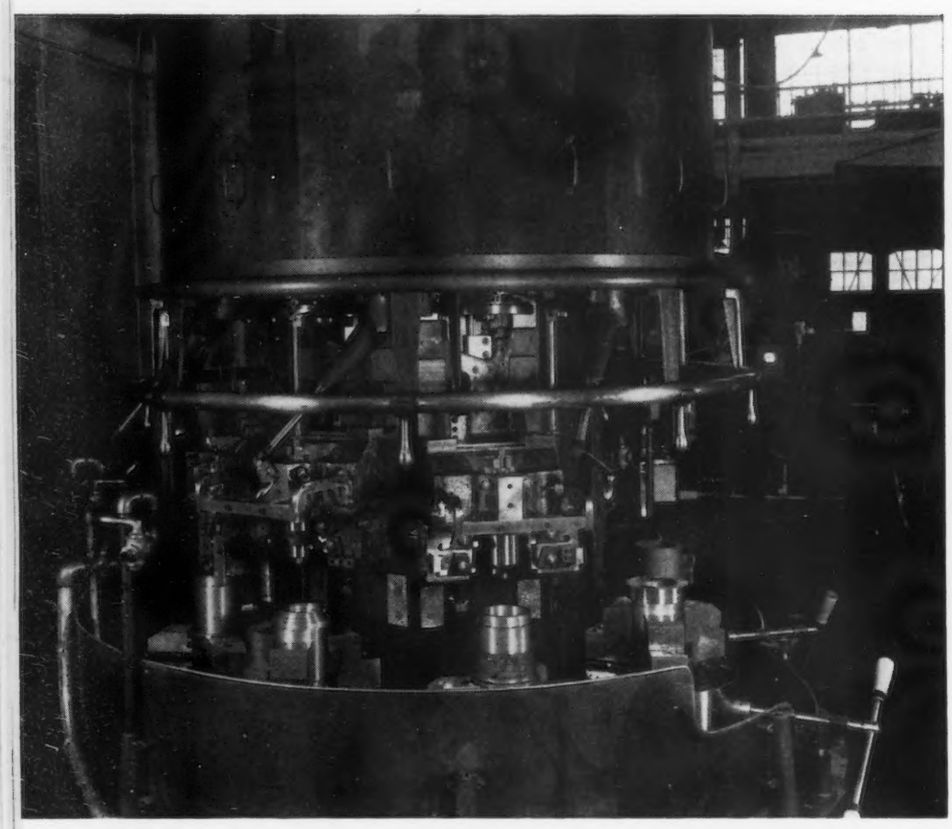
Power Losses Large

In the selection of this type of equipment, only units having adequate physical size to operate at temperature low enough to prevent undue fire hazard and short life should be considered. All the energy lost in the resistor must appear as heat dissipated in the air. In the case of a 200-amp. unit operating from a 250-volt circuit, this energy loss will be 40 to 45 kw.—enough to heat a large house in the coldest weather. Adequate ventilating air must be provided to carry off this heat, and the unit must be large enough to operate below red heat in order to avoid fire hazards. The line current is exactly the same as the welding current—in contrast to motor-generator set installations, where power line currents are only a fraction of the welding current. Unusual attention must therefore be given to the possibility

circuit voltage is involved, no peculiarities in welding characteristics will be observed, with normal technique. Any type of d.c. electrode may be used, provided the necessary arrangements for correct polarity are made, and about the only unusual feature of the circuit will be extraordinary persistence of the arc; that is, it will be harder to stop the arc.

Due to the higher voltage employed when this equipment is connected to shop circuits, very particular care must be taken to guard against the hazard of electrical shock. Operators should stand on insulating mats of dry wood, cork, or rubber, and they should wear heavy gloves in good condition. Electrode holders should be especially well maintained, and should be built to afford complete protection from accidental contact with live parts.

Mult-Au-Matic Set-Ups



1. Rotating cam blank for a Hydromatic variable-pitch propeller blade is machined from the rough in this 16-in. eight-spindle type D Bullard Mult-Au-Matic installed at the Hamilton Standard Propellers division of United Aircraft Corp. The machine is a double indexing type and after the part has been partly machined it is reversed and sent around a second time. In this view the first operation is shown at the right at station 3, stations 1 and 2 being loading stations. First operation is to bore and turn half way down the piece. First operation, second chucking, shown at left, is to start the breaking down of the cylindrical collar to rough form a cone. This is done with three roughing tools feeding straight down.

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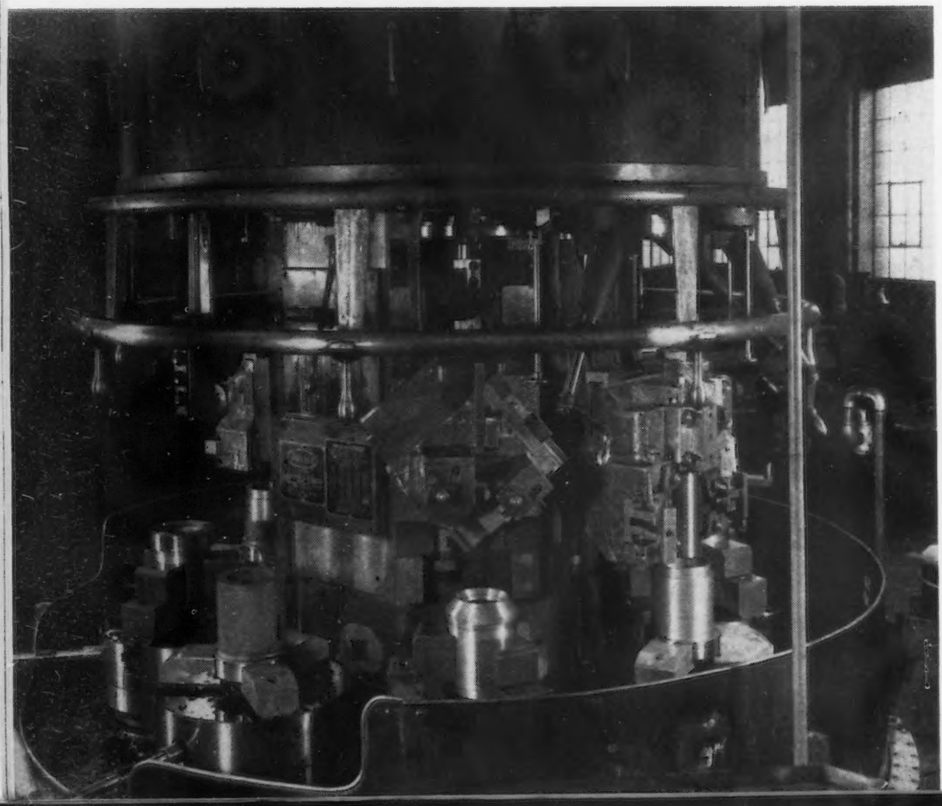
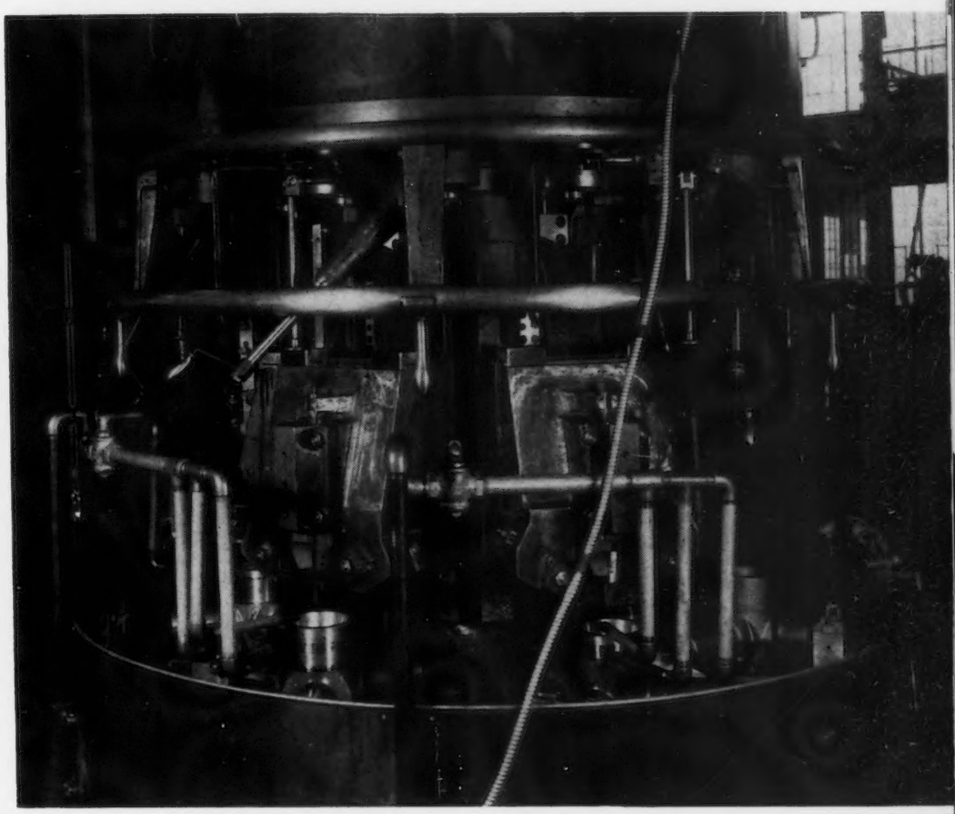
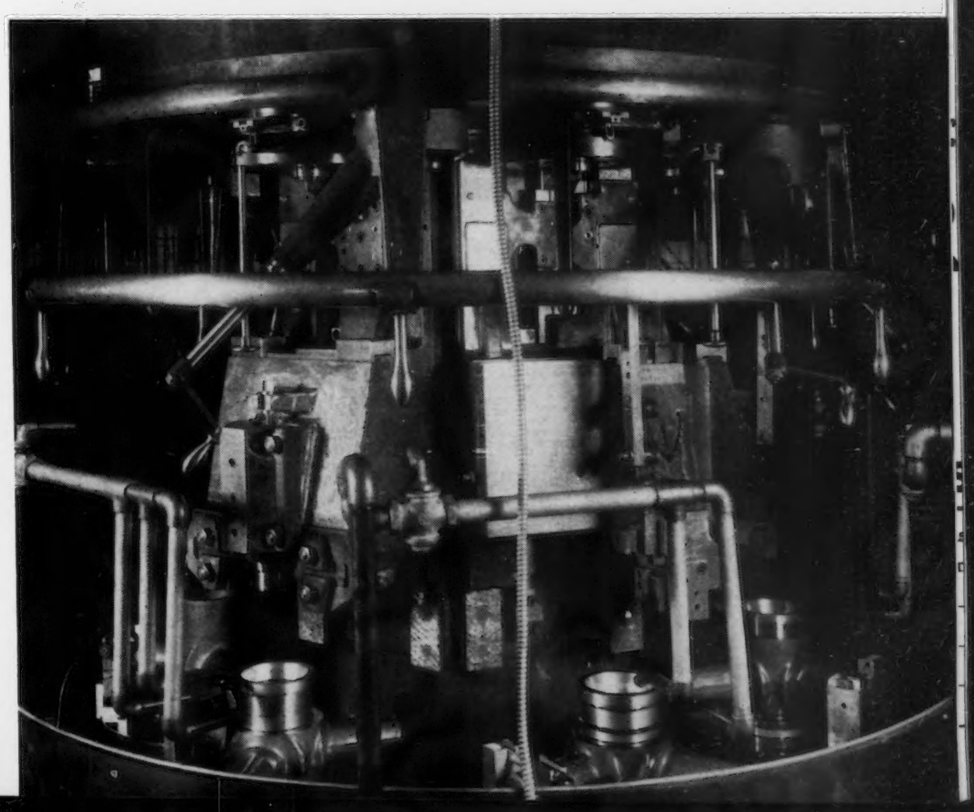


2. This view shows the last two operations on each chucking of the same cam blank. At the right the part which was rough bored and turned completely at station 5 (first chucking) is finish bored, and finish turned the full length at station 7, right. At station 8 in the center (second chucking) the cone is finished with a single point tool carried on an angular tool slide, having been previously broken down by straight down feed roughing tools at station 6.

for Aircraft Propeller Hubs



3. Another typical Mult-Au-Matic operation is machining propeller spiders from tough alloy forgings having a maximum hardness of 415 Brinell. Illustrated on this page is second operation work on a 16-in. six spindle Bullard. The base of the spider has been previously turned, faced and angularly bored at one end in another Mult-Au-Matic. For the second operations, the work can be located from finished face, centralized and clamped by an expanding arbor. In addition the three arms are held by leaf clamps. Second and third stations are shown, in which a 15-deg. taper is rough bored, the o.d. of the top collar of the hub turned and also faced. At station 3, left, the 15-deg. taper is finish bored and the remainder of the shank turned on the o.d.



4. At stations 4 and 5 (right) the hub shank is rough and finish recessed by tools carried on cross feeding slides. The finishing cut is more of a shaving operation performed with a single wide-faced tool. The top of the collar is faced at the same time. Last operation at station 6 (left) is a straight boring operation. Hinged tool setting gages are mounted on each tool slide for speeding set-up of tools on all the Bullards, of which there are seven in this department.

All-Metal Welded Cruiser

"REVERE," an all-metal, 45-ft. cabin cruiser recently completed in the Palmer Scott yards at New Bedford, Mass., for the Revere Copper & Brass Co. Built entirely of metal from keel to cabin, the cruiser was launched in July.

The hull, built of alloy steel sheets that were specially curved and flanged, has been assembled, and the keel has been welded to the garboards by spot and arc welding methods. Built inside a wooden framework, shown in Fig. 1, that was accurately shaped to the finished lines of the cruiser, the flanges of the abutting sheets are welded together forming the bracing system for the hull. Reinforcing angles were later spot welded inside of the hull, assuring increased strength and safety.

The garboards are 0.080 in. cupro-nickel sheets. They were first spot welded to the keel, which is ½ in. thick, and then the entire lower edge of the garboards were arc welded with a weld running the entire length of the boat.

To avoid the difficulty of overhead welding while fastening the keel, a rolling jig, illustrated in Fig. 2, was built around the entire hull so that it could be tilted 90 deg. to either side of the boat.

Because the flooring system and fore and aft stiffeners of the cruiser were built before welding, and because the external mold forms a very rigid molding jig, any warping or twisting that occurred was immediately detected and measures taken to correct and compensate for the condition. The cruiser will be powered by two 316 hp. Scripps motors.

Ben Dobson designed and was the supervising architect of this novel cruiser, and Luc Norman, Palmer Scott's mold loft man, designed and built the rolling welding jig, as well as the external mold for the hull and the internal mold for the superstructure.

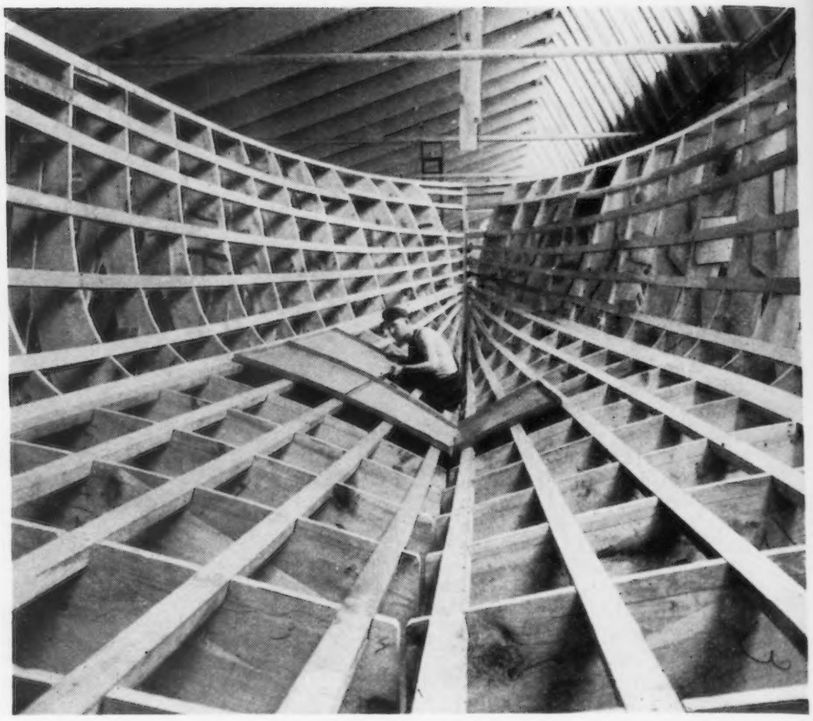


FIG. 1—Sheets, properly curved and flanged, are fitted on a temporary supporting wooden framework shaped to the lines of the hull. Flanges of abutting metal sheets are welded together and help brace the hull.

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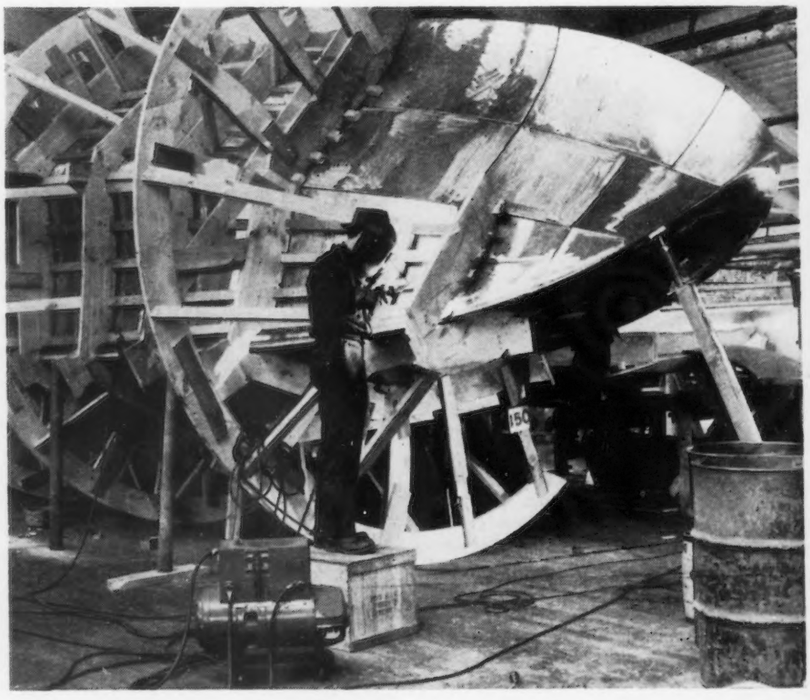
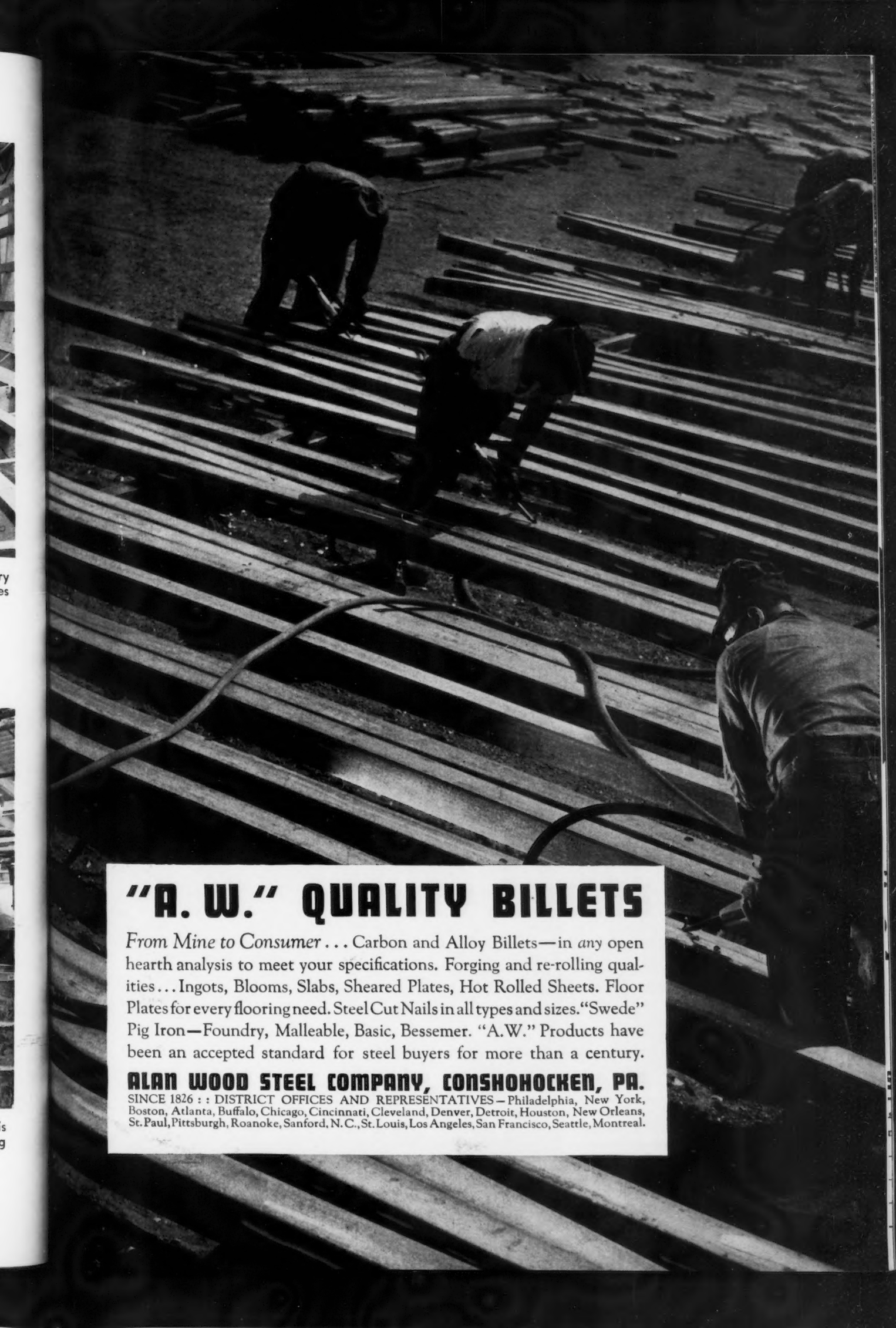


FIG. 2—Built in a rolling jig to eliminate overhead welding, the hull is hove down and garboards welded to the keel, with a 45-ft. weld running the entire length of the boat.



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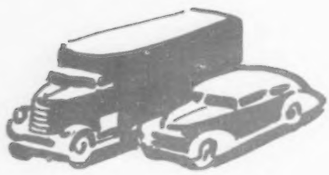
Assembly Line

• Detroit to reach volume output of defense products this fall, top speed in 1942 . . . Tooling for bomber airframe projects lags . . . 800 more machines to be installed before Packard Rolls Royce engine output reaches 40-a-day goal.



DETROIT—Estimates are now being prepared so Chrysler can tool up to produce four times as many tanks as originally scheduled. Plans which were made at the start of the Chrysler Tank Arsenal program called for tools and equipment to turn out 10 units per production day of 20 hours. Now the Tank Arsenal itself is figuring on an output of 20 tanks per day and Dodge is studying a program which calls for an additional 20 tanks per day. This will bring the total daily output at peak to 40 tanks per day.

At present the Chrysler Tank Arsenal is within a few weeks of being able to acknowledge that it has "started them rolling" but it is understood that the Arsenal is actually turning out one complete tank per day at the present time. On the assembly line are 30 units in various stages of completion.

The 700 firms in 130 cities in 20 states which are helping Chrysler make these tanks probably haven't been warned about the extra volume they will be called upon to produce, but probably most of them can count on a quadrupling of their production rates.

It is going to be fall before volume production is apparent in Detroit on most defense products and it will be 1942 before the automotive capital really hits it pace. Shells, machine guns and Rolls Royce engines are other products which are already in production—either on schedule or ahead of schedule. Packard's dedication of its Rolls Royce engine production facilities recently signified the completion of one of OPM's first major projects. As stated by William S. Knudsen, director general of OPM, "this is one job which the OPM considers behind it. From now on, it is a question of man-hours of labor, nothing else."

Sir Henry Self, representing the British Air Commission, paid tribute to American industry when he said about the Packard facilities, "never before has a job like this, on this scale, been tooled up in the short period of 10 months." He was referring to the million square feet of floor space that was equipped with 2200 machine tools in approximately 40 weeks. There still remain 800 machines to be installed before the plant reaches its peak production of about 40 engines a day about the first of the year.

GUESTS at the Rolls-Royce "preview" were given a quick view of the production facilities as they rode around on small factory trailers behind a plant industrial truck or "jitney." The quick birdseye view included one battery of 92 Gardner machines for cleaning and polishing aluminum parts: six carburizing furnaces; two atmospherically controlled, oil-fired heat treat furnaces; six Lindbergs and a battery of Ajax-Hultgren salt bath furnaces; five barrel-type nitriding furnaces; and a variety of other equipment indicative of the fact that aircraft engines do require a lot more heat treating than commercial products usually receive.

Machining of the crankshaft requires 85 different operations on 108 machines. First the crankshafts are rough machined to within one-eighth inch of final dimension, inspected, given a stress relief treatment. Then they are machined to within twenty thousandths of an inch, given another stress relief heat treat, and then finish ground within a profilometer reading of one and one-half to two microinches.

Testing and inspection of Rolls-Royce parts requires no less than 25 Magnaflux testers, another indication of the fussiness of the job.

Bearings used in the engine are Indium plated to prevent corrosion.

FORD'S OWN PLANE ENGINE: Experimental tests of Henry Ford's new 12-cylinder plane engine (below), said to develop 1800 hp., are already under way. The engine is a V-12. A cast, instead of forged, crankshaft, and a cast one-piece cylinder block are features expected to lend the engine to mass production. Quantity output at the Rouge plant would follow Army approval of the engine. *Photo by International*

CALL 'EM *RIGHT!*

If you find it difficult to describe a tap correctly, or if you are in any doubt about the exact meaning of certain terms, the definitions on this page may help you. Keep it for handy reference.

AXIS OF TAP: The longitudinal central line through the tap.

BODY: The threaded and fluted part of tap.

CHAMFER: The tapered outside diameter at the front end of the threaded section.

CUTTING FACE: The front part of the threaded section of the lands.

EXTERNAL (MALE) CENTER: Sometimes termed "male center." It is the cone shaped end of the tap. It is found only on small taps and is for manufacturing purposes. It is usually found only at the threaded end.

FLUTE: The groove providing for the cutting faces of the threads or teeth, for chip passage and for lubrication.

HEEL: The back part of the threaded section of the land.

HOOK: The curved undercut of the cutting face of the land.

INTERNAL (FEMALE) CENTER: Sometimes termed "female" center. It is the small drilled and countersunk hole at the ends of the tap, necessary for manufacturing purposes.

LAND: The threaded web between the flutes.

POINT DIAMETER: The outside diameter at the front end of the chamfered portion.

RADIAL: The straight cutting face of a land which, if continued, would pass through the center of the tap.

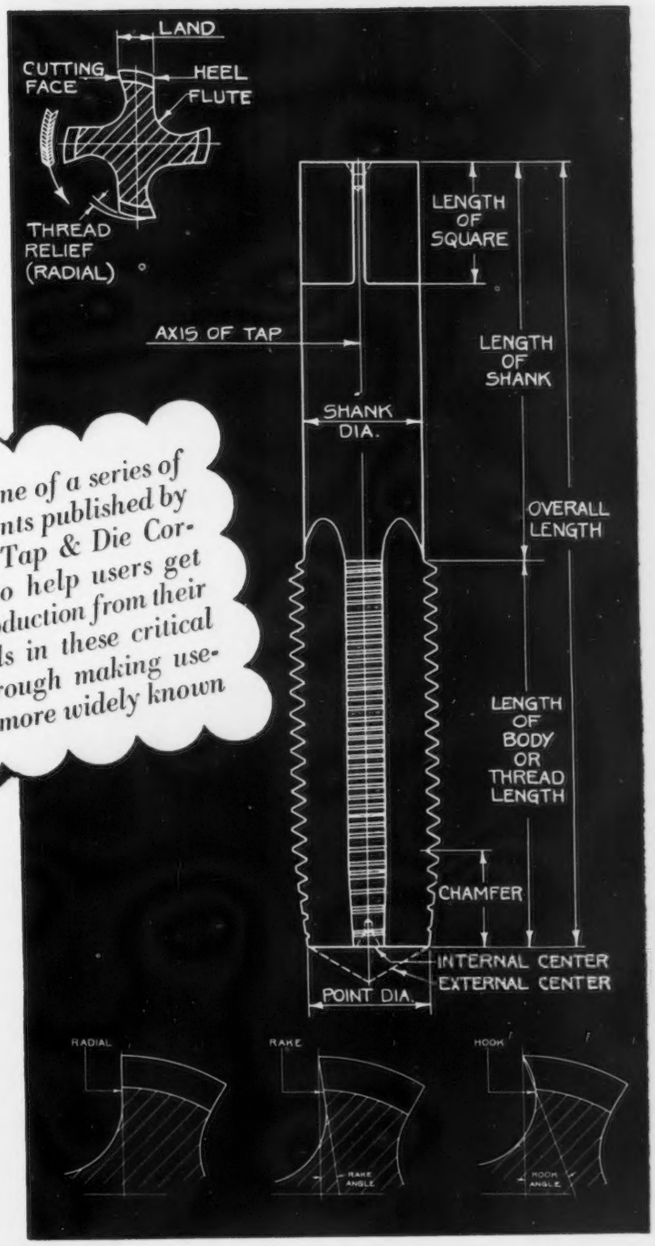
RAKE: The angle of the cutting face of the land in relation to a straight line from the point of the cutting face to the axis.

SHANK: The part behind threaded and fluted section of tap.

SQUARE: The squared end of the tap shank.

THREAD: The cutting tooth of the tap which produces the thread.

THREAD RELIEF (RADIAL): A clearance providing a gradual decline in the major, pitch and minor diameters of the lands, back of the cutting face. This style of relief is applied only to certain sizes and types of taps.



This is one of a series of advertisements published by Greenfield Tap & Die Corporation to help users get greater production from their small tools in these critical times, through making useful facts more widely known

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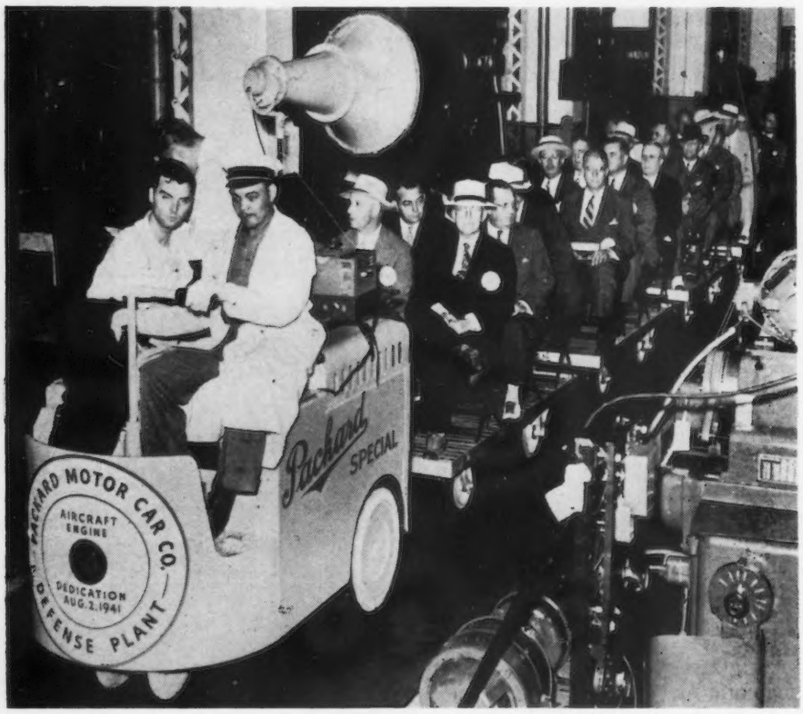

PACKARD SPECIAL: To make inspection of its new Rolls Royce engine plant easy, the Packard company provided a special train for its hundreds of guests. Six thousand such engines have been ordered for the British, 3000 for the U. S.

The Indium is valued at $12 per Troy ounce.

One of the largest departments in the Rolls-Royce plant is the one where all aluminum castings are carefully cleaned by brushing and grinding before machining. All of the fine particles of aluminum are reclaimed by an elaborate hopper system in conjunction with a forced air system which carries the particles away from the operator, through duct work, and through filters.

PACKARD'S test equipment occupies a large part of the floor space in the new plant. It includes 26 test cells insulated against noise and each provided with batteries of instruments and 2000 hp. dynamometers. There are two propeller test cells where the engines are given a test equivalent to what they would undergo on airplanes in service. There are flexible engine mounts to duplicate conditions of flight installation. During tests the engines turn 19 ft. propellers and operate on controlled atmospheric pressure supplied through the carburetor air intake to simulate altitude flight conditions. Entirely different from the relatively brief "run-ins" for automobile engines, these tests include twelve and one-half hours of operating, six and one-half immediately after assembly and another six hours after tear-down inspection. The tests require 596 gallons of gasoline.

Although the Rolls-Royce engine horsepower is now considered a military secret, it is known that they develop in excess of 1200 hp. and they may have been "suped up" within the past year. The engines weigh 1460 lbs., have 4 5/16 in. stroke and 6 in. bore. Displacement is 1649 cu. in.

The most serious lag in defense tooling programs is that in the bomber airframe projects. Briggs has been by far the most successful in getting underway and is the only one of the automotive concerns that can fairly be said to be in production. Shipments of three or more pairs of wings per day to Vought-Sikorsky are being made steadily. Briggs is also supplying substantial quantities of parts to Boeing and Douglas. Most of these parts are bomb doors, flaps, air ducts, and similar units. In this program Briggs is making remarkable use of spot welders. All the evidence substantiates the observation that Briggs is actually doing more spot welding than any other automotive or aircraft concern. Moreover, it is unique in the fact that it is welding primary structures, including wing covering of sheet aluminum alloy. It was the earliest firm in the airplane program, as reported here before, and is operating purely as a private contractor on its own initiative.

THERE is serious dissatisfaction still being expressed by other contractors against the repeated delays in obtaining the information they need to tool up for production. Little is heard from Ford on this score, or from Chrysler, although their silence is no indication that everything is going smoothly. From almost every other direction, however, there are complaints at the slowness with which information, drawings, specifications, etc., are being released by airplane companies. The airplane manufacturers are throwing the blame at the military services. Wherever it lies, it is seriously hampering the tooling up programs here in Detroit.

Even Fisher, with its close connection to the General Motors subsidiary, North American, has been put off, month my month, week by week, since last winter. Most recent promise has been that all necessary information will be forthcoming September 1 or October 1.

Murray has had to cancel some of its orders for assembly fixtures because its program has been upset. First, it will be recalled, the airplane design was changed and repeated modifications and changes were put through. When design troubles appeared to be cleared up, four-engine bombers took precedence over two-engine bombers and the Murray schedule was trimmed drastically. Murray appears to have been inclined to let its tooling program go ahead as scheduled but (possibly as a result of an OPM

(CONCLUDED ON PAGE 106)

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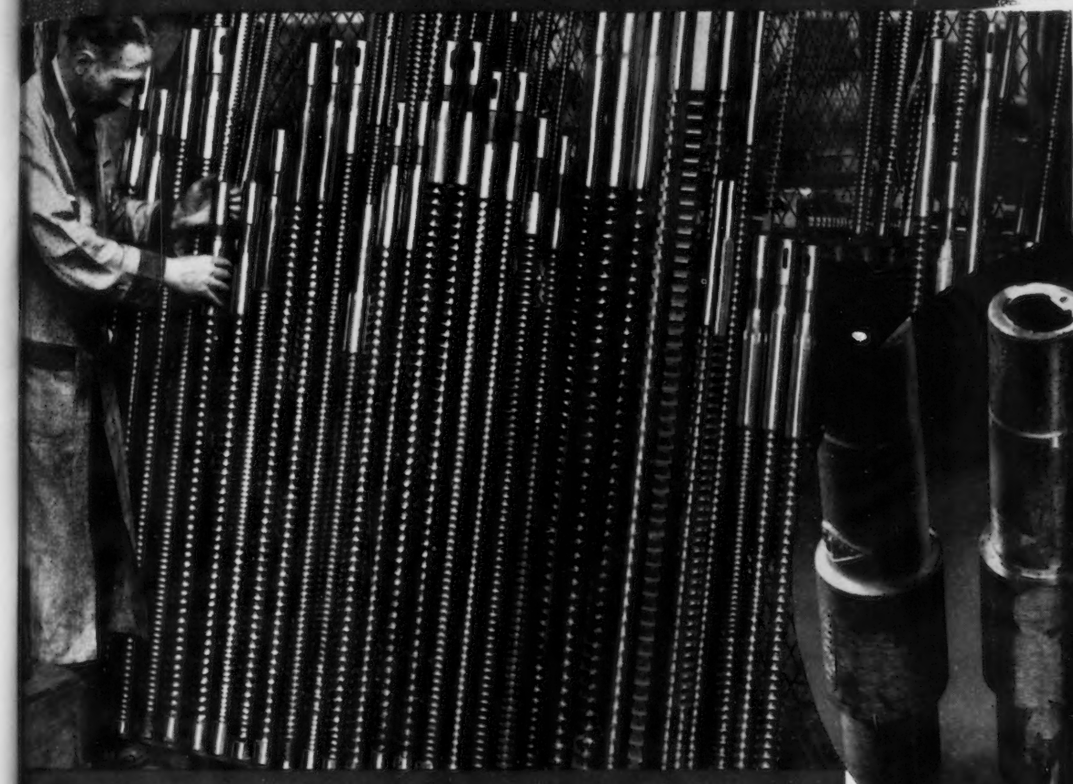

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The use of Oilgear Horizontal Broaching Machines enabled the Gisholt Machine Co. to improve the design of this cone gear sleeve with a solid key the full length of the sleeve. It prevents play and wear between shaft and sleeve. Former design was a keyway in gear sleeve, locked on spline shaft with a wing key.

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Washington

• Some Army men reported convinced that bloc in Congress regards defense program merely as gigantic pork barrel . . . OPM and OPACS seen near point of open hostility . . . $25 billion public works program ready for postwar use.

WASHINGTON—The United States News says that some high army officers are becoming convinced that an important element in Congress regards the whole defense program as little more than a gigantic pork barrel.

This is an extremely unfortunate sentiment to prevail in the nation's lawmaking body at this time. Whether or not politics is being played with defense, the fact remains that the country now faces a real emergency.

There are members of Congress, however, who will not admit that a national emergency exists. They appear to be immunized to emergencies. They say that the present administration over its eight years in office has become so emergency-minded that it declares emergencies on the slightest provocation or entirely without reason. Going further, claims are made that emergencies have been repeatedly declared for purely political reasons, either to submerge a bad economic situation or to force through legislation.

So those who charge that the present is a pork barrel defense program treat the "emergency" lightly or seek to dispose of it easily by saying that another emergency or so does not matter. They also make the point, and in this instance with good reason, that defense officials are going around the country telling people how much defense money has been poured into their sections of the country. This is taken to smack of "come along" tactics to build up self-interest in the grisly but necessary business of war. It is remindful of the wild spending days of PWA.

IN campaigns New Deal speilers would regale audiences with the dollars and cents value their bailiwicks were getting out of the delirious spending program. That is to say, voters were looked upon and treated as chattels, whose political support was urged in return for the bountiful outpouring of the eternally deficit ridden Federal Treasury. Carefully forgetting to explain that these self-same voters would one day—and the day is at hand—have to pay for this largesse themselves, the windy, cunning spellbinders talked as though the money with its blessings grew out of their personal generosity, something that has been markedly absent in New Deal circles. But spending and gratuities, together with one-sided legislation, have accomplished the end sought—it has perpetuated the New Deal in office. How much longer the perpetuation will continue remains to be seen. That the government means to take over after the present war emergency may be surmised from the fact that a public works pro-

BIG BILL: By the end of 1941, William S. Knudsen (center), will have walked through the gates of most important U. S. defense plants and will be able to say I have inspected them all. Here the OPM director general is being interviewed by Detroit magazine and newspapermen.

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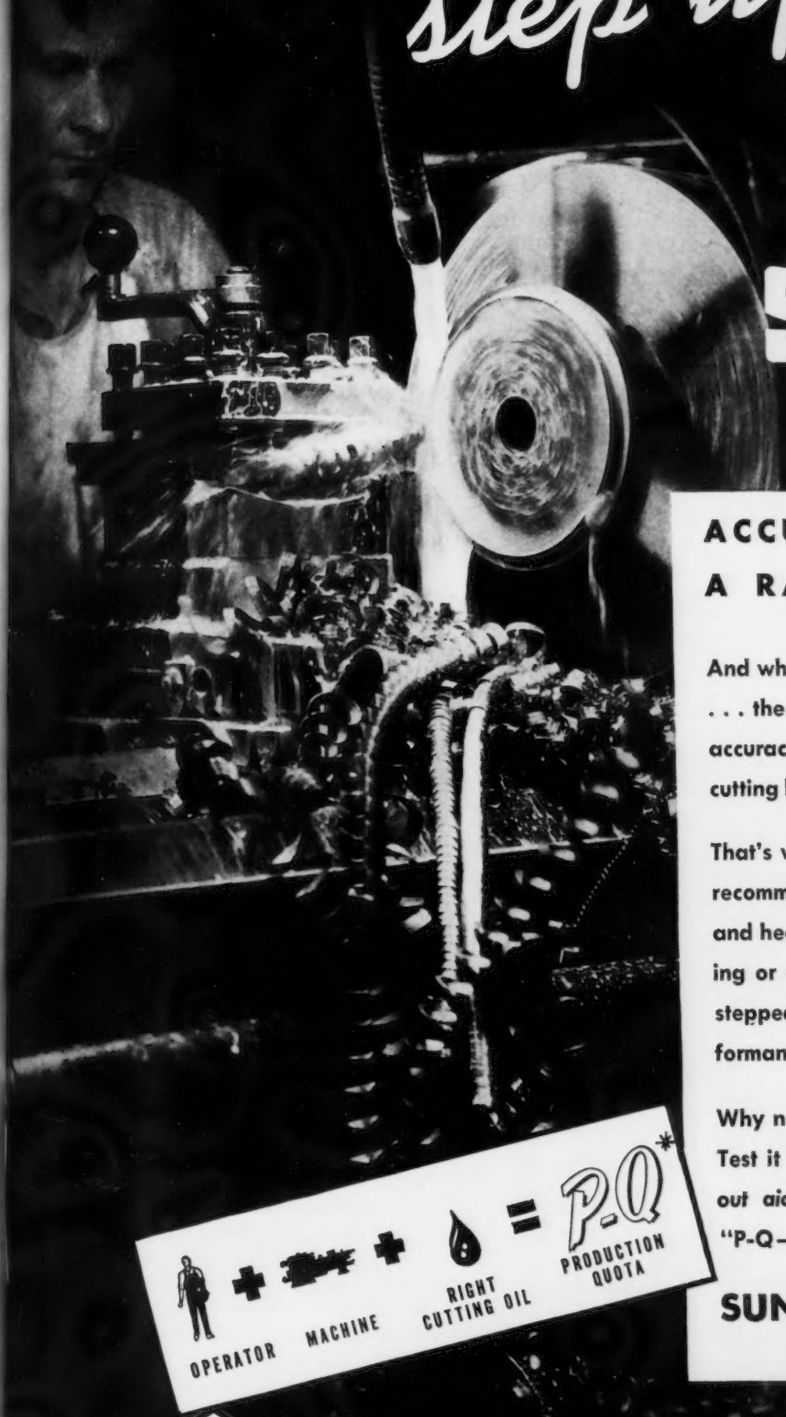

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ACCURACY AND FINE FINISH ON A RATED CAPACITY-*plus* BASIS!

And what is "stepped-up P-Q"? It's the higher Production Quota . . . the increased rate of production, finer finishes and improved accuracy . . . obtainable when the operator, the machine and the cutting lubricant are all working together for the greatest efficiency.

That's why leading machine-tool manufacturers choose, use and recommend SUNOCO Emulsifying Cutting Oil. Its high lubricating and heat-absorbing qualities protect the tools from seizing, burning or chipping. Sunoco makes possible prolonged tool life . . . stepped-up operator's productive time . . . and machine-tool performance at rated capacity-plus—*helps maintain a higher P-Q.*

Why not let Sunoco help in boosting the P-Q of *your* machines? Test it in your own plant . . . let it prove its ability to give *"all out aid"* to hard-pressed machine-tools. Send for your copy of "P-Q—Your Key to Increased Production." Write Dept. E-

SUN OIL COMPANY • PHILADELPHIA

Sponsors of the Sunoco News Voice of the Air—Lowell Thomas

SUN OILS

PETROLEUM PRODUCTS FOR ALL INDUSTRIES

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gram of $25,000,000,000 now is ready to be pulled out of the pigeon hole.

There is no doubt that these are some of the reasons that the Administration does not have the needed national unity. Important groups in Congress of all poltical persuasions have lost confidence. In the Administrative end, they see conflicts on the defense program and suspect that New Dealers are trying to edge in more and more on the defense program and simultaneously edge out or to subordinate prominent business men now participating in the program.

THE defense agencies are not clicking together at all. OPACS and OPM seem almost at the point of open hostility and sooner or later this difference has to be ironed out and defense set up under a central head if the program is going to emerge from the rut it is falling into. Sweeping reorganization of the defense machinery is necessary and the more quickly it is done the better it will be for the country, yet the White House delays action and thus adds to Congressional doubt over the entire program.

This skepticism notwithstanding, there can be no safe choice other than to prepare the country for any eventuality. If politics is being mixed with defense spending, then it is for those who charge that this is so to expose the situation and prevent, if possible, its continuation, but to go along and give support to an honest defense program.

June Manganese Output 3100 Tons—Stocks Lower

Washington

• • • **The Bureau of Mines** reports that June domestic production of manganese ore containing 35 per cent or more manganese was 3100 gross tons, shipments were 3300 tons, while producers' stocks at the end of the month amounted to 1300 tons. Production for May was 2600 tons, shipments were 2900 tons and producers' stocks at the month's end were 1500 tons.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

WHAT WAS THAT YOU SAID AGIN?
I SAID GOOD MORNING
IT LOOKS LIKE THIS SPEEDY GOVERNMENT BUNCH IS GOT THE OL' BULL O' TH' WOODS INOCULATED WITH TH' SPEED BUG! IN ALL MY YEARS HERE I NEVER SAW HIM PADDLIN' THAT FAST!
HE HAS TO, IF HE EVER EXPECTS TO FIND OUT WHAT'S GOIN' ON AROUND HERE -- ONE OF THEM GOVER'MENT MEN MAY SAY A WORD TOO MUCH SOME TIME AN' GIVE HIM A HINT OF WHAT WE'RE DOIN'!
J.R.WILLIAMS 8-22
THE VAGABOND KING
COPR. 1941 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

OPM Seeks to Expand Bessemer Steel Use

Washington

• • • **The OPM steel** unit had under study this week steel industry proposals for expanding bessemer capacity and for air conditioning and enlarging blast furnaces as a means of maintaining and increasing steel production despite the shortage of scrap.

W. A. Hauck, OPM steel consultant who asked steel companies last week to submit proposals with all possible speed, also was in receipt of a list of products now made of open hearth steel that could be produced with bessemer steel. Finishing nails, also queried last week, have since supplied OPM with a similar list.

The use of bessemer steel, considered satisfactory for wire, light structural materials, concrete reinforcing bars, pipe, certain grades of tin plate and some ship plates, is expected to be recommended to some consumers after the survey is completed.

Air conditioning of blast furnaces, an operation requiring an estimated 6 to 12 months, was understood by OPM steel unit to have been in contemplation by a number of companies for some future date. OPM officials hoped that these companies and others would now go ahead with such projects without further delay. They estimated that construction of additional bessemer capacity would require 12 months; enlargement of blast furnaces, about half that time.

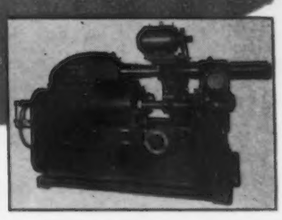
When the OPM first moved to bessemer capacity, recommending on July 23 an initial expansion of 6,508,950 tons in pig iron capacity, it took into account the use of bessemer converters for producing synthetic scrap and for the production of duplex steel as a method of increasing the capacity of open hearth furnaces.

After the proposals for building new bessemer converters, and for air conditioning and enlarging blast furnaces have been surveyed by OPM, it is expected to make recommendations to Federal Loan Administrator Jesse H. Jones, indicating the extent to which federal financing through the Defense Plant Corp. is necessary.

WHAT ARE YOUR REQUIREMENTS?

Mirror finish? Grey finish? Finish within 3 or 4 micro-inches? Absolute straightness and roundness? High production? Take a tip from the aircraft engine manufacturers — here, where finish, accuracy, and production are of such vital importance, Bryant Internal Grinders are the recognized choice. Overhead wheel slide, massive construction, rigidity, and ease of operation are features that are writing a new cost and production story in the aircraft industry. Let Bryant estimate the cost and production story on your own work — there is no obligation.

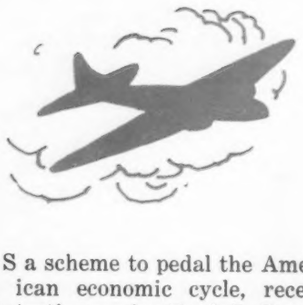
BRYANT CHUCKING GRINDER CO.
Springfield, Vermont, U. S. A.



SERIES 24 BRYANT
INTERNAL GRINDER

WEST COAST

• Bonneville Power administrator urges that government set up independent Western mineral industries... Warns that development must not be left to special interests . . . Forge plant to be built at Seattle.



AS a scheme to pedal the American economic cycle, recent testimony by Paul J. Raver, Bonneville Power administrator, takes its place with send-a-dime-to-the-name-at-the-head-of-the-list chain letters and Harry Hopkins' borrow-spend-tax squirrel cage.

Testifying before a sub-committee of the Senate's Committee on Public Lands and Surveys, Doctor Raver urged in effect that the federal government set up independent Western mineral industries to require more hydroelectric power plants to feed more independent mineral industries, and so on around the ferris wheel.

After chastising private industry for failing to take advantage of bounteous mineral resources and cheap government power in the Bonneville-Grand Coulee territory, Dr. Raver went on to allow that "the region may be facing during the next few years a critical shortage of power which may seriously retard industrial developments and as a consequence interfere with the present defense efforts." Specifically, he urged that new appropriations totaling approximately $30,000,000 be made immediately available to prevent "delays" in Bonneville's $66,000,000 1946 transmission construction program; that generator installations be speeded at Grand Coulee to permit the operation of 15 units by March, 1945; and that construction of a new multiple purpose dam on the Columbia River be undertaken as rapidly as possible.

Large industrial developments, primarily in the aluminum industry, have caused the Bonneville-Grand Coulee white elephant to change its spots almost overnight and generating capacity formerly regarded as superfluous is now taxed to capacity. Some Jeremiahs who do not believe that power demands for defense industry will continue forever aver that the most economical way to meet the unexpected demand is by means of interconnection with private and municipally owned utility systems in the region and beyond that by construction of steam generating plants. Reluctance in accepting such suggestions is natural on the part of an enthusiast for federal ownership and hydroelectric plants on a vast scale.

Evidence as to why Dr. Raver falls in the latter category is supplied by his testimony before the Senate's sub-committee. This testimony begins by indorsing the view that far Western mineral deposits, knowledge concerning them and processes for their use are controlled by a few large industries; and that there is a obvious tendency to treat the West as a colonial dependency of the United States, not only by industry, but by the government itself. He then states that industry has "cloaked by technological justification" its specifications of grades of various minerals so that they can be obtained only by imports. Although "technological justification" is a synonym for "scientific logic" to an engineer, Dr. Raver regards it as a weapon of Big Business as unfair as poison gas.

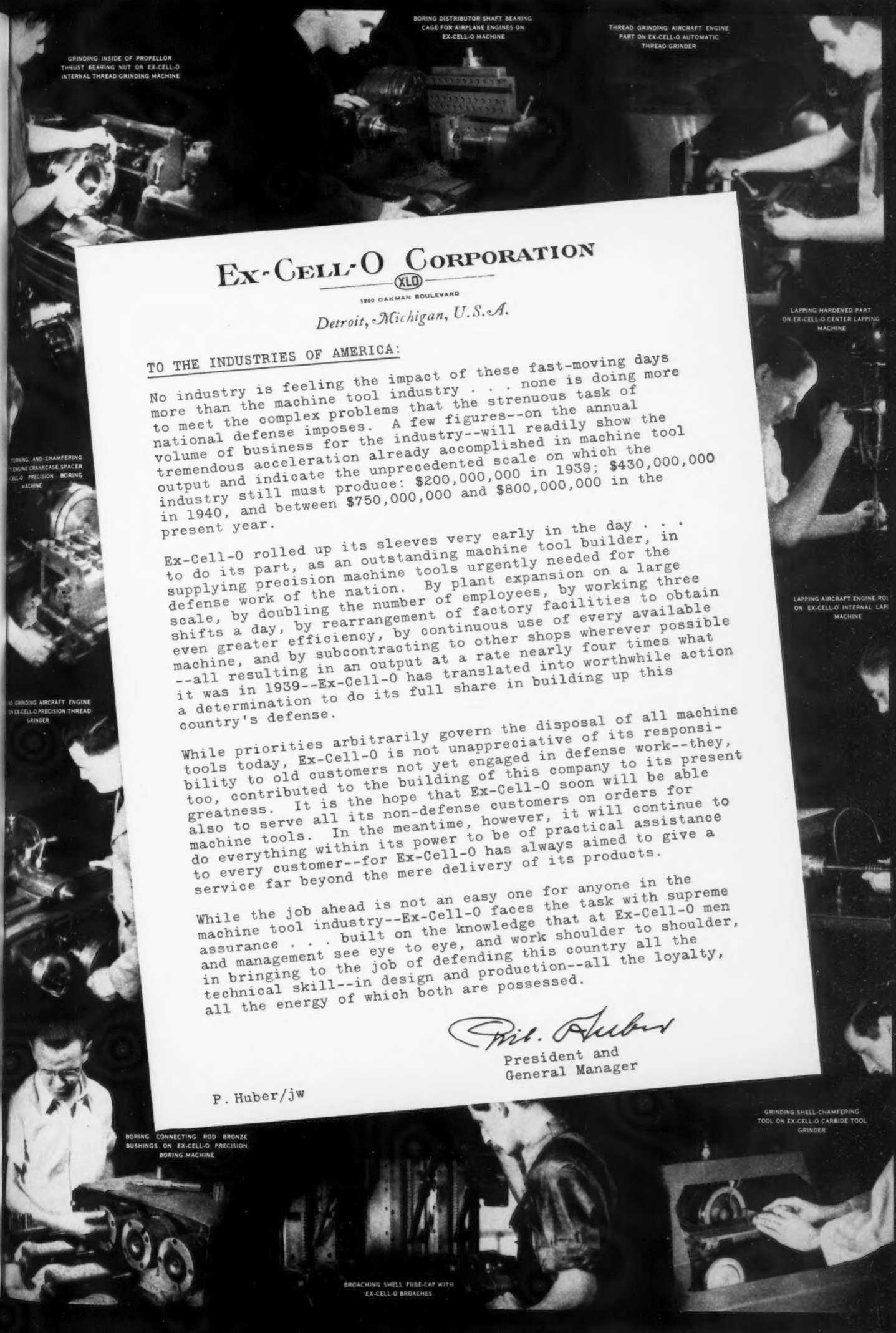
PROCEEDING in the belief that a more thorough inventory of far Western minerals would disclose deposits, particularly in iron ore, whose utilization could be technologically justified, Dr. Raver warns that developments must not be left to "arbitrary decisions governed by special interests." The government must push aside firms experienced in mineral development and reserve the field to independent Western entrepreneurs.

In emancipating Western industry, Dr. Raver warns that the Federal Government will have to make and publicize gratis studies of processes, markets, and resources, because the small investor "will never get that information from the large corporations who have it tucked away in their files and who are especially interested in seeing that no new competition develops." Insofar as iron and steel production is concerned, "large corporations" who have made studies on the Pacific Northwest have been very free in making known the results of their investigations much to the embarrassment of boosters for a large integrated steel industry in this territory based on government electric power and local iron ores.

To protect the far West from Eastern industrial ogres, Dr. Raver proposes that "under the defense emergency whenever the Federal Government provides for increased production in industries utilizing Western minerals, especially where such production is financed directly or indirectly with federal funds, the policy should be *deliberately to have new managements take over any plants or additional plant capacity.*" And so the reform movement joins hands with national defense!

The testimony reveals that Dr. Raver is still hurt because a large scale iron and steel plant has not been located in his territory to employ electric power in the reduction of local iron ores. Neither far Western expansion now proposed by Columbia Steel Co. and Bethlehem Steel Co. nor the rejected proposal of Henry J. Kaiser would bring electric ore reduction furnaces to the Pacific Northwest. Large scale electric reduction of iron ore, particularly in the Portland region, has received a cold shoulder presumably because of (1) the distance from major markets; (2) cost of electric furnace pig iron production as opposed to blast furnaces in other locations; (3) availability of scrap at tidewater mills cheaper than pig iron could be produced by any process; (4) a subordinate point, doubtful availability of sufficient raw materials to support a large electric furnace operation. This question is more exhaustively treated in the IRON AGE of March 21, 1940, and the situation with regard to costs and available raw materials has not changed greatly since that time.

DR. RAVER'S attitude is typified in his Senate's sub-committee testimony. He says, "I am puzzled by the constant opposition that has been voiced in many quarters toward the establishment of an integrated iron and steel industry in the Pacific Northwest. Twen-


GRINDING INSIDE OF PROPELLOR THRUST BEARING NUT ON EX-CELL-O INTERNAL THREAD GRINDING MACHINE
BORING DISTRIBUTOR SHAFT BEARING CAGE FOR AIRPLANE ENGINES ON EX-CELL-O MACHINE
THREAD GRINDING AIRCRAFT ENGINE PART ON EX-CELL-O AUTOMATIC THREAD GRINDER
LAPPING HARDENED PART ON EX-CELL-O CENTER LAPPING MACHINE
LAPPING AIRCRAFT ENGINE ROL ON EX-CELL-O INTERNAL LAPI MACHINE
GRINDING SHELL-CHAMFERING TOOL ON EX-CELL-O CARBIDE TOOL GRINDER
BORING CONNECTING ROD BRONZE BUSHINGS ON EX-CELL-O PRECISION BORING MACHINE
BROACHING SHELL FUSE-CAP WITH EX-CELL-O BROACHES

EX-CELL-O CORPORATION

XLO

1200 OAKMAN BOULEVARD

Detroit, Michigan, U.S.A.

TO THE INDUSTRIES OF AMERICA:

No industry is feeling the impact of these fast-moving days more than the machine tool industry . . . none is doing more to meet the complex problems that the strenuous task of national defense imposes. A few figures--on the annual volume of business for the industry--will readily show the tremendous acceleration already accomplished in machine tool output and indicate the unprecedented scale on which the industry still must produce: $200,000,000 in 1939; $430,000,000 in 1940, and between $750,000,000 and $800,000,000 in the present year.

Ex-Cell-O rolled up its sleeves very early in the day . . . to do its part, as an outstanding machine tool builder, in supplying precision machine tools urgently needed for the defense work of the nation. By plant expansion on a large scale, by doubling the number of employees, by working three shifts a day, by rearrangement of factory facilities to obtain even greater efficiency, by continuous use of every available machine, and by subcontracting to other shops wherever possible --all resulting in an output at a rate nearly four times what it was in 1939--Ex-Cell-O has translated into worthwhile action a determination to do its full share in building up this country's defense.

While priorities arbitrarily govern the disposal of all machine tools today, Ex-Cell-O is not unappreciative of its responsibility to old customers not yet engaged in defense work--they, too, contributed to the building of this company to its present greatness. It is the hope that Ex-Cell-O soon will be able also to serve all its non-defense customers on orders for machine tools. In the meantime, however, it will continue to do everything within its power to be of practical assistance to every customer--for Ex-Cell-O has always aimed to give a service far beyond the mere delivery of its products.

While the job ahead is not an easy one for anyone in the machine tool industry--Ex-Cell-O faces the task with supreme assurance . . . built on the knowledge that at Ex-Cell-O men and management see eye to eye, and work shoulder to shoulder, in bringing to the job of defending this country all the technical skill--in design and production--all the loyalty, all the energy of which both are possessed.

P. Huber

President and
General Manager

P. Huber/jw

ty miles from Portland lies a body of iron ore that has been investigated at different times over a period of 40 yr. by private companies. Claims are made that there are adequate amounts of ore to support an iron and steel industry of moderate size; counter-claims are also made that the amount of ore is negligible. I am curious why no authentic information is accessible either through private or public channels of the true situation."

Dr. Raver does not say why he believes another survey at this time would reveal the "true" situation anymore than the investigations during the past 40 yr.

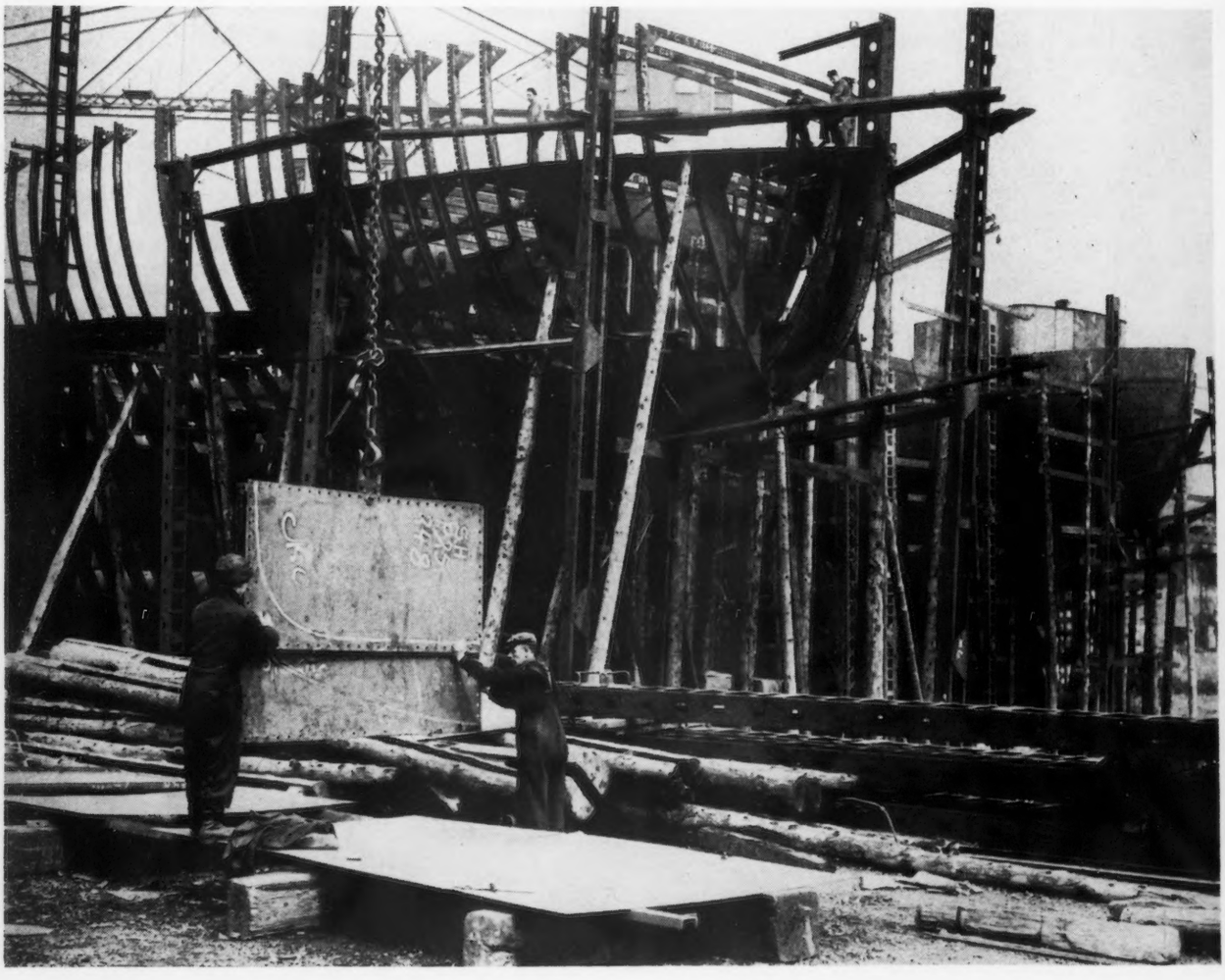
As to the particular deposit to which Dr. Raver refers, size has not been the only bar, although an effective, one to utilization as the basis of an iron or steel operation. Dr. Raver's own Bonneville Project in its "Report On Feasibility of Iron And Steel Production In The Northwest Using Columbia River Hydroelectric Power" list this deposit as containing 2,000,000 tons or more of limonite ore running from 45 to 55 per cent Fe, but states "it is possible that his estimate may be tripled when all known occurrences are drilled." Even if the estimate were tripled, this deposit would hardly justify a large integrated iron and steel industry. The objection most often heard to this deposit, as to most other far Western deposits, is that considerable sulphur is revealed wherever prospecting is carried to sufficient depth to reach any considerable distance below the surface. Sulphur content is also said to be irregular, another troublesome factor in operation. Although this objection might be overcome, so many more favorable deposits are available that this one has not received a great deal of attention. At least that is one explanation as to why the Portland deposit has been passed up.

EXPLORATION of far Western ferrous ores will be made, however, as a result of a $350,000 appropriation passed June 30 by the Senate.

Announcement was made last week by Isaacson Iron Works, Seattle, that it will build a $2,600,000 forge plant not far from Boeing Aircraft plant No. 2. This will be one of the largest plants in the country devoted to producing ship shafting, stern frames and all other heavy forgings, most of which have had to come from the East heretofore.

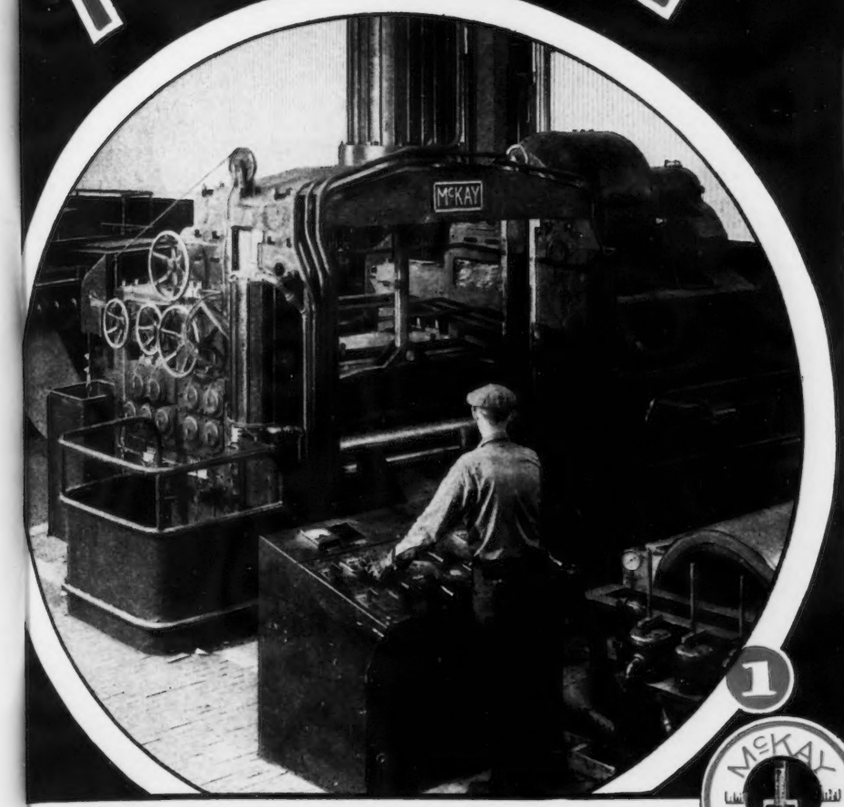
MORE SHIPS: Shipyards all over England and Scotland are working 24-hr. shifts to replace vessels lost by enemy action in the battle of the Atlantic.

Photo by British-Combine



McKAY

1. The McKay Processing Uncoiler.
2. The Budd-McKay Processing Machine.
3. McKay Heavy Duty Backed Up 4-Hi Plate Leveller.
4. Backed-up Roller Leveller.



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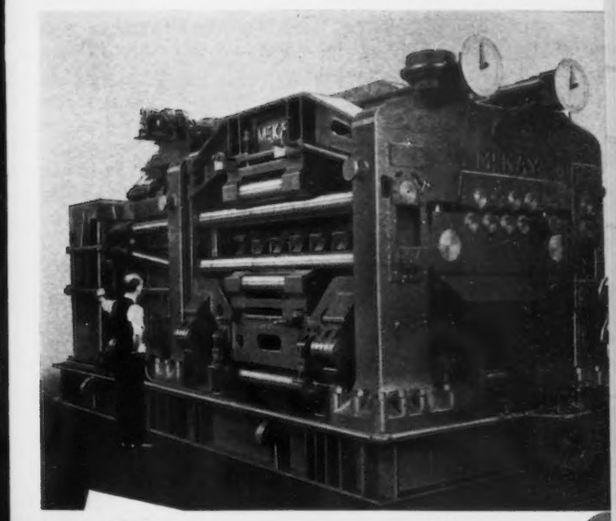

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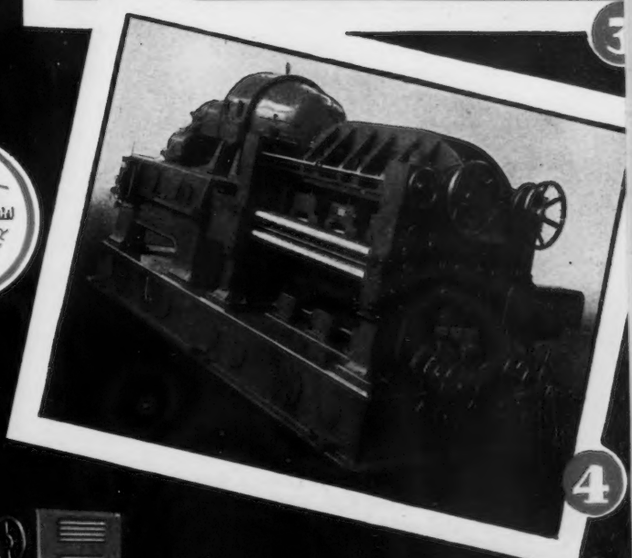
McKAY MEKROMETER ADJUSTMENT



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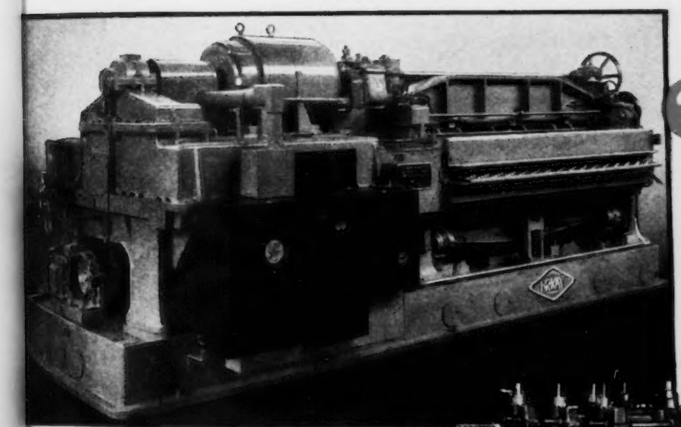


2

5. McKay Electric Tube Welder.

5

The McKAY MACHINE Company

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY

The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

Fatigue Cracks

BY A. H. DIX

Metrical Orchid

• • • A eulogy in flawless iambic octameter has come in from W. C. (Minnesota Power & Light Co.) Lounsbury. It reads in part:

I like to see what brains can do
So I read always Iron Age through . . .
I read the puzzles, where they start
To go both ways, from miles apart.
And then I try my college math
To end up filled with direful wrath . . .
Yet when I've read the Iron Age through
Both wit and knowledge I accrue.

We love every foot of it, not only because of the sentiment but because it reminds us of our favorite, *Casey at the Bat.* We would not be so ungrateful as to look a gift poem in the meter, but we would like a little help with the second line, "*So I read always Iron Age through.*" It scans all right visually, for "iron" appears as a bisyllabic, but is pronounced as a single syllable.

The only way we can get the swing right when we recite it is to break "iron" boldly into two syllables and accent the "ron" like this, "I always read I-*ron* Age through." Would you care, Mr. Lounsbury, if we tossed in a "the" and made it read, "I always read The Iron Age through?"

When You Say That, Smile

• • • Speaking of swing, oxymoronic is what Ernest C. (Clark Controller Co.) Clark calls our recent phrase, "*Major Bowie . . . is spoken of in earth-measuring circles in the same hushed tones that Benny Goodman commands in the swing set.*" Oxymoronic sounded like a fighting word to us, but we find from the brains department's big dictionary that it merely means a combination of contradictory or incongruous words.

We admit that the phrase lacks the smoothness of Byron's "She walks in beauty, like the night," but swing is not necessarily noisy and swing addicts do discuss their high priest Goodman in awed tones. However, if we had it to do all over again we would have said "with the same respect that Heifitz commands among taut gut devotees."

Stoppers

The Case of the Almost Borrowed Saw—*Wells Mfg. Corp.*

Teaching Hungry Acid Table Manners—*National Lead Co.*

Six Dollar Divorce

• • • A Reno (Nev.) manufacturer writes that he was visited on Apr. 11 by a man who gave the name J. Carey and said he was authorized to accept subscriptions for your favorite family journal. He was paid $6 and gave a receipt form bearing the name "National Associated Publications—Chicago, Kansas City, San Francisco."

We had never before heard of Mr. Carey or the National Associated Publications, and have heard from neither of them since. If Mr. Carey or a gentleman giving any other name should call on you and offer a receipt printed "National Associated Publications," please be cool to him.

They Know Everything

• • • It has always been our belief that one of the most dependable measures of the esteem in which a publication is held is the number of requests for help it receives from its readers. In the case of your favorite family journal these requests are now at an all-time high, and we are continually bug-eyed over the high batting average the brains department maintains in answering them.

The magnitude of the brains department's fund of knowledge frightens us. We hope that it never gets out of hand, for if, as in the case of the split atom, it should run wild there would be h. to p. Take, for instance, the matter of the annual toll rust takes, a question put up to us the other day by a Chicagoan. The brains department knows down to the fourth decimal place—$1,000,000,000.0000 for this country, $3,000,000,000.0000 for the world, at current rates of exchange, of course.

But it would be unfair to the rest of the organization to say that the gray matter is concentrated in one department. When Walter H. (U. S. Tariff Commission) Rastall asked, as he did recently, "*Where in the northern hemisphere does the sun rise in the north and set in the north?*" it was Chester Howard Ober of the advertising staff who, after studying the problem for a couple of nights, answered offhand:

> If you started at the North Pole Mar. 21 and traveled at a daily uniform speed, reaching the Arctic Circle on June 22, turned around and reached the North Pole Sept. 23, you would see the sun each day at midnight rising and setting in the north.

It sounded screwy to us, too, but we put it up to the big star, planet and sun man, William H. Barton, Jr., Executive Curator of the Hayden Planetarium, and he says it is all right. We had hoped that the original inquirer would question the answer, so we could have cracked, "We are glad that you're wrong, you Rastall, you."

The records show that we are batting exactly .991 in answering inquiries. Our showing would be perfect if people would stop sending in foolish questions like the one that came in the other day from a Texas manufacturer—"*Where can we get ⅜-in. copper tubing?*"

Hear, Hear

• • • Bill Sherman's fine two-part article in the last two issues on die-typing mentions master-master dies. We would like to see them stamping waste waste tinplate in a plant located in Walla Walla. The press operator, should of course be New York Congressman Phelps Phelps, who, for art's sake, should have a slight case of beri beri.

Falling Follicles

Rust spots are beginning to appear in our mental roofing. Can you tell us what treatment is recommended?

—Inquiry from an upper New York State institution

Try olive oil and a brisk massage.

"K" and "G" Switch

Knawing at the core of this trouble is . . .

—From The Iron Age's "On the West Coast"

It should be cut out with a gnife.

Automotive Cigarette Cough

Your item about the car accessory that delivers lighted fags. This is old stuff; I had one. It not only smoked cigarettes but drank water. You had to let it suck up a rinse every so often to cut the gum. It worked off the intake manifold, which accounts for my experience. My engine eventually began to cough and get palpitations. The diagnosis was "smoker's heart."

W. A. M.

Puzzles

Last week's fox weighed 66 lb.

Answers are still coming in to the digit problems. Latest scorers are Otto (Milcor Steel Co.) Teufelbeiser, N. S. (Belmet Products, Inc.) Hardy and Don (Phosphor Bronze Smelting Co.) Beaver. But in sorrow we report that the master minds cold shouldered the July 31 golf pro problem en masse. Not a single solution has come in, and we are, as we say in Brooklyn, disappernted. Come, come, m.m.'s, chin up, never say die, carry on, and labor omnia vincit.

If you can get this in one turn of a 30-min. hour-glass you can let out your ego another notch:

What number, when multiplied successively by 1, 2, 3, 4, 5 and 6, gives products which contain the same digits arranged in the same succession?

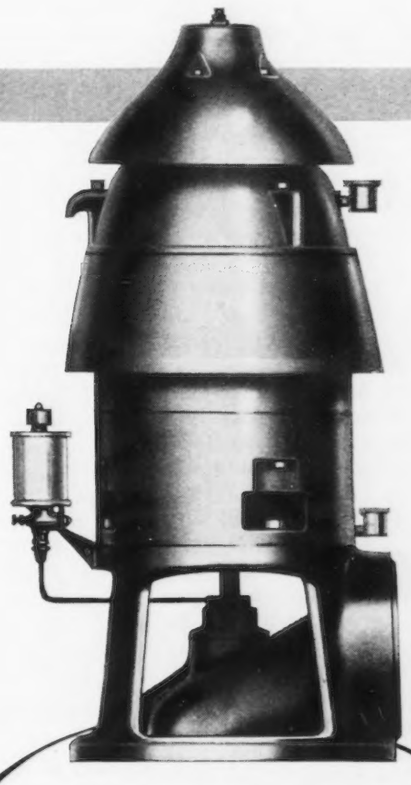
HOW TO INCREASE PRODUCTION

WITHOUT USING MORE POWER . . .

IF YOUR pumps are not of the latest, improved designs, they are probably wasting power which you could use profitably to increase plant capacity.

Ten-year-old pumps of certain types, even if as good as new, take a 25% greater toll at the power meter than today's Fairbanks-Morse models. And 3- or 4-year-old pumps of other types consume so much more power than current models that continued use is not only more costly than replacement, but is intolerable because it dissipates vitally needed power resources.

Before arranging for increased power supply, take every practical step to eliminate power waste. A Fairbanks-Morse Pump Engineer can tell you quickly, without cost or obligation, whether your pumps are the types which waste power . . . which carry such heavy obsolescence penalties that new pumps would pay for themselves in as little as a year. Find out now. Write Fairbanks, Morse & Co., Dept. H38, 600 S. Michigan Ave., Chicago, Ill. Branches and service stations throughout the United States and Canada.



FAIRBANKS-MORSE TURBINE PUMPS

Complete range of capacities (35 g.p.m. to 4000 g.p.m.) for electric motor, Diesel or gasoline engine, or steam turbine drive. Open or closed impellers, oil or water lubrication. Today's 6″ F-M Turbine is *23% more efficient* than the same size was in 1927; today's 10″ turbine is *21% more efficient* than the 10″ pump was in 1927!

FAIRBANKS · MORSE PUMPS

DIESEL ENGINES ELECTRICAL MACHINERY RAILROAD EQUIPMENT WASHERS-IRONERS STOKERS
MOTORS FAIRBANKS SCALES WATER SYSTEMS FARM EQUIPMENT AIR CONDITIONERS

This Industrial Week . . .

. . .

FOR the last 48 hours incoming mail bags in steel producing and consuming plants in the United States have been sagging with a special message from the Office of Production Management in which, for the second time in 23 years, the government ordered all steel to be diverted to defense use where necessary for national defense. For the second time, makers of peacetime products must live off the leavings.

After months of straining and stretching by steel makers to swell production—which at 47,730,225 net tons for the first seven months of 1941 was 63 per cent above the output for 1917 in the comparable period — defense agency leaders concluded that there was not enough steel for "immediate delivery" for all defense and peacetime uses.

OPM Letter

To the hundreds of producers and the thousands of purchasers of steel, E. R. Stettinius, Jr., the OPM Director of Priorities, wrote: "The director of priorities of the OPM is today (Aug. 9) filing for publication in the Federal Register, General Preference Order M-21 (text published on page 91), which places all producers of steel under a mandatory priority system, and which imposes various obligations on other persons in the steel industry. . . ."

Of all the recent weeks of mounting defense problems, the U. S. metal producing and metal working industries are finding this week the most fructiferous. Steel producers are faced with a mountain of clerical work that compares favorably in size with any paper task of the depression and post-depression years. Steel orders estimated in number at more than a million must be reclassified under the new mandatory priority order which stipulates that each producer must file monthly reports with the Division of Priorities, summarizing by group and by product classification, orders received and shipments made during each month, and unfilled orders as of its last day. If defense orders are unreasonably rejected or delayed, the customer can protest and have the producer hauled before the priorities division to explain.

Official Ghost

The director of priorities may issue special directions to producers to deliver steel in fulfillment of specific defense needs and, according to the provisions of the priority order, can sit in, in the flesh or as a sort of official ghost, at the Friday and Saturday meetings at which steel plant operating men stage their weekly struggles to draw up mill schedules for the following seven days.

Included in the fine print of general preference order M-21 were several paragraphs which described conditions under which defense orders need not be accepted. This applies (a) if delivery of steel on schedule would be impossible because of previously accepted defense orders bearing equal or higher preference ratings, (b) if the steel ordered is not of the kind usually produced or capable of being produced by a company, (c) if the buyer is unwilling or unable to meet regularly established prices and terms of sale and (d) if such defense orders specify deliveries within 21 days, and if compliance with such delivery dates would require the termination or alteration before completion of a specific production schedule already commenced.

Form PD-73

Beginning Sept. 1 purchase orders for steel must be accompanied by a special form known as PD-73 (see pages 81A-81B), which will set forth the purposes for which the ordered material will be used.

To persons closest to the defense picture it was growing clearer at mid-week that the provisions of the OPM steel order must be applied with common sense. Where following the order literally would result in actual loss of steel production through drastic upsetting of rolling mill schedules, the mills are likely to use discretion, with government approval.

One result of the ordering of full priorities on steel, which follows a similar order for pig iron on Aug. 6 and which will itself be followed shortly by special regulations governing distribution of alloy steels, is that the steel manufacturer is relieved of the burden of convincing unbelieving customers regarding the crushing pressure of de-

mands for defense steel. With all good will, the steel producer can tell his customers:

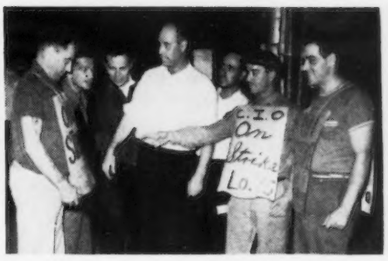
See Stettinius

For steel consumers who make peacetime products it has been a rough week. Small metalworking plants in many areas are noting with an anxiety (which is not getting enough defense agency attention) the current wiping of their orders from steel company books. For such plants the expression "war prosperity" is an abuse of terms. Many of them may yet be found mulish in their unwillingness to give up hard-earned competitive positions because of the defense program and to die gracefully without annoying Washington.

Installment Buying

Big steel users are quickly learning what is in store for them. This week the automobile manufacturers, leading consumers of steel in many recent years (7,185,016 net tons in 1940) again felt the twist of the government's rope in President Roosevelt's executive order directing the Federal Reserve Board to limit installment buying.

A paradox in the week's industrial headline news—in which the steel priorities order deservedly took the largest type—was the rise of new strikes in such steel-consuming defense units as the Federal Shipbuilding & Drydock Co.'s plant at Kearny, N. J. There CIO union efforts to force dismissal by the management of non-conformists and union rule breakers among 16,000 employees closed the entire shipyard and brought the country close to its second government defense plant seizure—the first was the North American Aviation Corp. plant occupation on June 9. The



Kearny situation seemed to involve principles of freedom often mentioned in statements of aims by democratic nations. Both the CIO shipbuilding union and the shipyard (U. S. Steel Corp. subsidiary) management asked the government to take over the yard to end the strike. To Secretary of Navy Knox, L. H. Korndorff, Federal Shipbuilding president, telegraphed:

"IN THE INTEREST OF NATIONAL DEFENSE WE HEREBY OFFER OUR SHIPYARD AT KEARNY, N.J., TO THE NAVY DEPARTMENT FOR IMMEDIATE POSSESSION AND OPERATION. THE YARD HAS BEEN CLOSED FOR FOUR DAYS BY A STRIKE WHICH INVOLVES NO ISSUE BUT THE MAINTENANCE OF THE OPEN SHOP. WE ARE UNWILLING TO ABANDON THE DEFENSE OF THE FREEDOM OF THE AMERICAN WORKER TO CHOOSE WHETHER HE WILL BELONG TO A UNION OR NOT. WE WILL FULLY COOPERATE WITH YOU IN MAKING THIS OFFER EFFECTIVE."

On Tuesday it seemed likely that the important Kearny yard, with its unfinished cruiser, destroyers and merchant ships, would go under government control in a case which may have revealed U. S. Steel Corp.'s policy toward the closed shop. The Federal Shipbuilding strike and the unauthorized AFL machinists' strike at the Curtiss-Wright propeller plant at Caldwell, N. J., and shutdowns elsewhere in U. S. industry suggest that (1) providing enough defense plant steel by restricting commercial steel is not the only defense agency problem and (2) joining of the U. S. S. R. to the ranks of democratic nations has not of itself brought U. S. industry complete peace and quiet.

Song About A Union

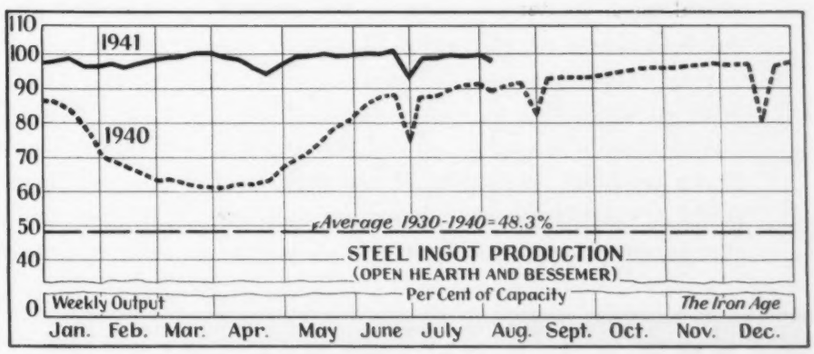
At Milwaukee, according to a dispatch to THE IRON AGE, a song about a CIO union brought a minor crisis for an Allis-Chalmers workman. A Department of Labor Conciliation Service observer, on a government expense account, reported that the song, while not flattering, was not unduly derogatory to the union, and pronounced the singer a faithful and efficient employee.

Of growing gravity to steel consumers and producers is the growing scrap shortage, already snowballing into a position where it gets a high priority rating on the country's list of unsolved problems. Largely because of this shortage, steel operations dropped a full percentage point this week to 98.5 per cent from 99.5 per cent last week. In some cases mill schedules are tapering at the end of each week because of lack of scrap.

Agents of the Federal Bureau of Investigation are understood to be calling on scrap dealers following the Justice Department's inquiry into OPACS Administrator Leon Henderson's charges that violations of anti-trust laws have curtailed scrap supplies and artificially raised scrap prices above government fixed levels. And loss of scrap to Britain resulting from substantial shipments to that country of semi-finished steel rather than finished material (which would leave the scrap at home for melting in U. S. furnaces) has left some industrial observers puzzle-headed.

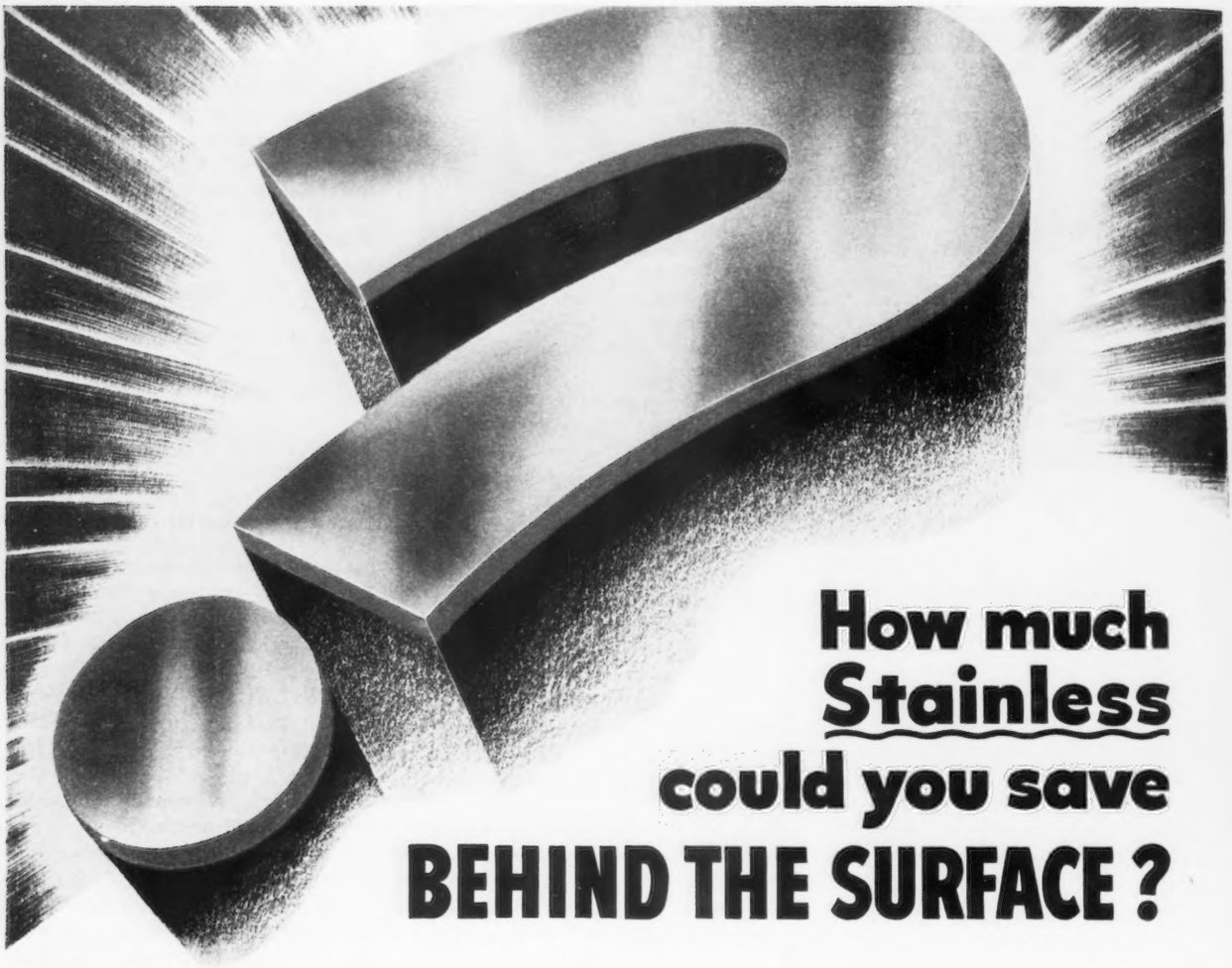
Orders At 130 Per Cent

For most steel makers, the past week was another period of taking orders far above their capacity to produce. Bookings at big centers, like Pittsburgh and Cleveland ranged from 120 to 130 per cent of capacity. A report—this one will not down—that Britain is selling finished steel for export has been joined by suggestions that unwarranted steel inventories at some consuming plants, including a Navy Yard, should be looked into by the OPM in the light of the steel shortage which has made mandatory steel priorities necessary now. To build the 1820-mile-long pipe line submitted this week to Oil Coordinator Ickes by 11 oil companies, the steel industry must find somewhere another 400,000 tons of steel, the elite material in the U. S. defense arsenal.



Steel Ingot Production, by Districts—Per Cent of Capacity

	Pittsburgh	Chicago	Valleys	Eastern, Pa.	Cleveland	Buffalo	Wheeling	Detroit	South	S. Ohio River	West	St. Louis	East	Aggregate
This week	100.0	100.0	99.0	97.5	93.0	104.5	91.0	104.5	95.0	98.0	102.5	111.0	98.5	98.5
Week ago	101.0	100.0	98.0	97.5	98.0	104.5	91.0	104.5	95.0	102.0	102.5	111.0	94.0	99.5



How much Stainless could you save BEHIND THE SURFACE?

You'll grant the importance of conserving strategic alloys for victory on our production lines. That fact alone makes Pluramelt a "V . . . –" steel.

But there's more to it than that. Many current uses of stainless steel actually need the alloy characteristics only on the surface. Such products could employ Pluramelt at a saving in first cost and fabricating cost, yet without sacrificing appearance or utility.

And there's the other side of the picture. Many products now made of common steel could be vastly improved, from a competitive standpoint, if made of Pluramelt. You can't discount the selling appeal of a bright, lasting stainless surface!

Pluramelt is an exclusive product. It consists of a backing of mild or low alloy steel, armored on one or both sides with the proper grade of stainless to fit your conditions. It handles and works easily, is thoroughly proved in service on a wide variety of products, and cannot come apart.

We'll be glad to send you more complete data or discuss the application of Pluramelt to your products. Just mail the coupon below.

PLURAMELT — ARMORED AGAINST CORROSION, HEAT, WEAR

ALLEGHENY LUDLUM
STEEL CORPORATION — PITTSBURGH, PA.
Branch Offices in AL *Principal Cities*
STOCKS OF STAINLESS CARRIED BY ALL RYERSON WAREHOUSES

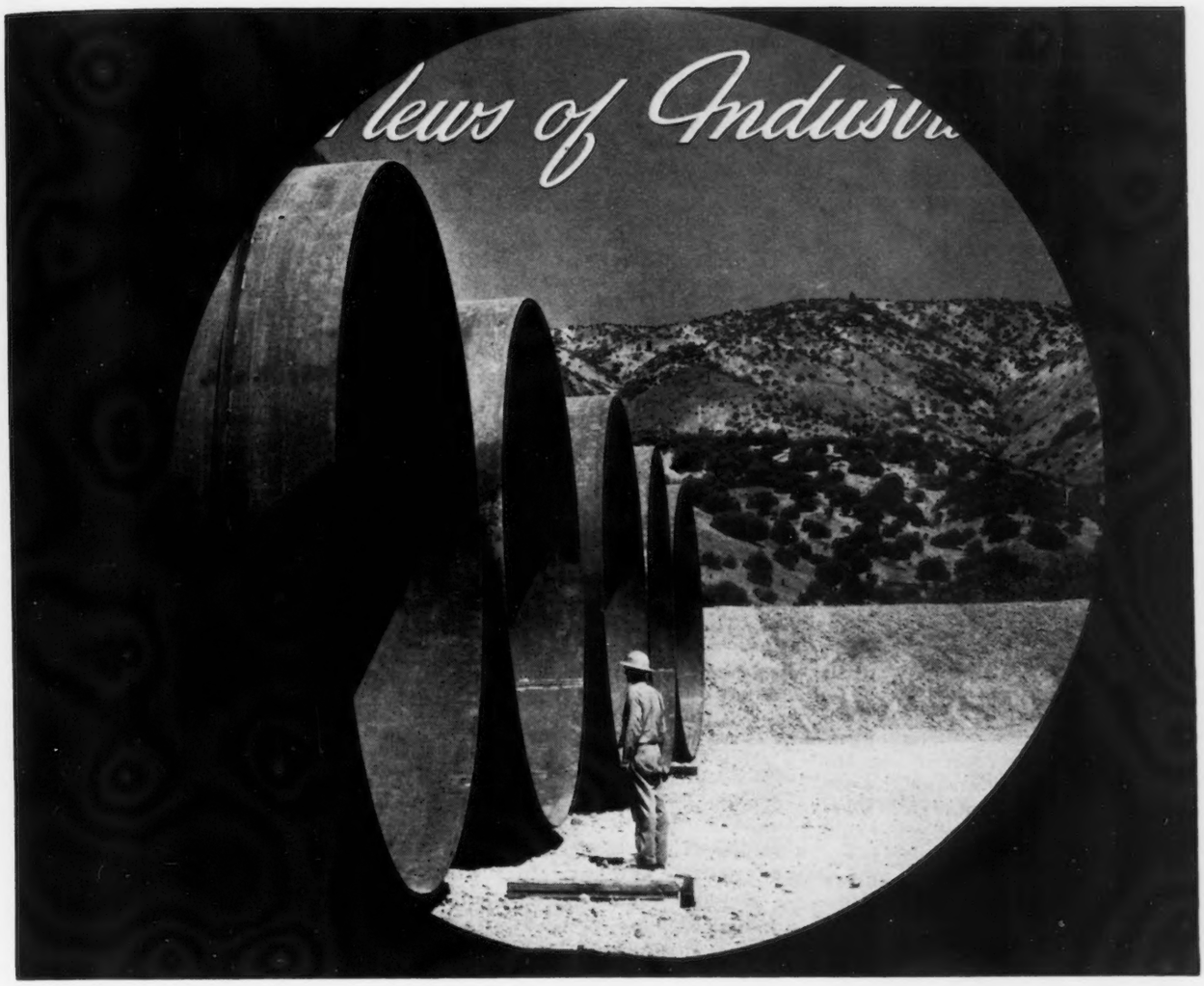
Allegheny Ludlum Steel Corporation A-22
Oliver Building, Pittsburgh, Penna.

Send me complete information on Pluramelt.

NAME_____

COMPANY_____

ADDRESS_____



Mandatory Priority System for Steel Announced by OPM

Washington

• • • **A mandatory priority** system for steel, requiring steel producers to fill defense orders ahead of all other contracts and authorizing the Director of Priorities to allocate orders and adjust production schedules, was made effective on Aug. 9 by the OPM priorities division. Steel in all forms, including alloy steel, is affected by the order putting defense requirements "uncompromisingly ahead of non-defense needs."

The action, which had been expected for some time, was made necessary, OPM said, by a growing shortage of certain types of steel products and by a total demand for immediate delivery beyond the ability of the steel industry to produce and deliver. OPM steel advisers said that the action safeguards the defense program against delays resulting from failure to obtain steel when needed, and at the same time clarifies the position of steel producers who have been operating in recent months under a combined inventory control and preferential classification system.

Defining steel as including "all carbon and alloy steel castings, ingots, blooms, slabs, billets, forgings, and all other semi-finished and finished rolled or drawn carbon and alloy steel," the new priority move assigns to all defense orders not bearing a higher rating a preference rating of A-10. Specifically, the order:

1. Defines defense orders and requires that they be accorded preferential treatment;

2. Prohibits the accumulation of inventories beyond current needs;

3. Prescribes a new form (PD-73) on which customers are required to file with each purchase order going to a producer a summary of the contents of the order by group and by product classification;

4. Requires producers to file with the Division of Priorities a monthly report, summarizing by group and by product classification, orders received and shipments made during the month,

SHASTA PENSTOCKS: The supply of steel for government projects like the Shasta Dam in California may be affected by the new OPM order placing steel under a mandatory priorities system for defense. At the top of the page is a photo taken from inside a 15-ft. steel pipe section to be used to carry water from a reservoir to the Shasta powerhouse.

and unfilled orders as of the last day of the month; and

5. Delegates to the Director of Priorities broad power to direct deliveries, and the placing of purchase orders.

These five points were described as among the more important provisions of the order in a letter directed to all producers and purchasers of steel by Director of Priorities Edward R. Stettinius, Jr. Mr. Stettinius placed emphasis on a recent law passed by Congress which exempts from liability for damages or penalties anyone who defaults on a contract by reason of any rule, regulation or order issued under the statutory authority vested in the Division of Priorities.

Other basic provisions of the steel order include:

1. A formula covering the acceptance of defense orders requires that defense orders, whether or not accompanied by a preference rating certificate, be accepted and filled ahead of all other contracts or orders except (1) where delivery on schedule is impossible because of defense orders previously accepted and bearing a higher or equal preference rating; (2) where the steel ordered is not of the kind usually produced by the person to whom the defense order is offered; or (3) where the person seeking to place the defense order is unwilling or unable to meet regularly established prices and terms of sale, but there shall be no discrimination against defense orders in establishing such prices or terms of sale.

2. Instructions that if defense orders are rejected or delivery is delayed unreasonably, the customer may bring this to the attention of the Division of Priorities for appropriate action.

3. Permission to make deliveries under non-defense orders after all defense orders have been satisfied. After defense requirements, direct or indirect, have been met, any allocations or other directions covering the residual supply of steel will be made according to the determinations of OPACS under its civilian allocation program.

4. A stipulation that the terms of the order apply to all intra-company deliveries.

5. A requirement that beginning Sept. 1, purchase orders for steel must be accompanied by a special form (PD-73) obtainable from steel producers setting forth the purposes for which the ordered material will be used.

6. Special instructions that the Director of Priorities may issue specific directions, requiring steel deliveries to be made during a specified period on contracts or orders for particular purposes or to particular persons. In carrying out such directions, Mr. Stettinius could modify or adjust particular production schedules and could require a steel customer to place an order with a particular producer.

7. An answer to the problem concerning the sequence of deliveries where orders have been given the same preference rating explains that such deliveries are to be governed by the delivery dates specified in the respective preference rating certificates assigned. Where ratings were assigned without the issuance of a certificate, the dates specified in the contract, commitment or order will be decisive. Where preference ratings and delivery dates are the same, and deliveries on schedule become impossible, the matter should be referred to OPM.

Previously iron and steel products had been placed on the priorities critical list, which gave Army and Navy orders priority, and they were subjected to inventory control and to the terms of the General Steel Preference Delivery Order No. 1. The latter order, designed to expedite delivery of defense steel, is revoked as a result of the latest steel priority action. The order also re-

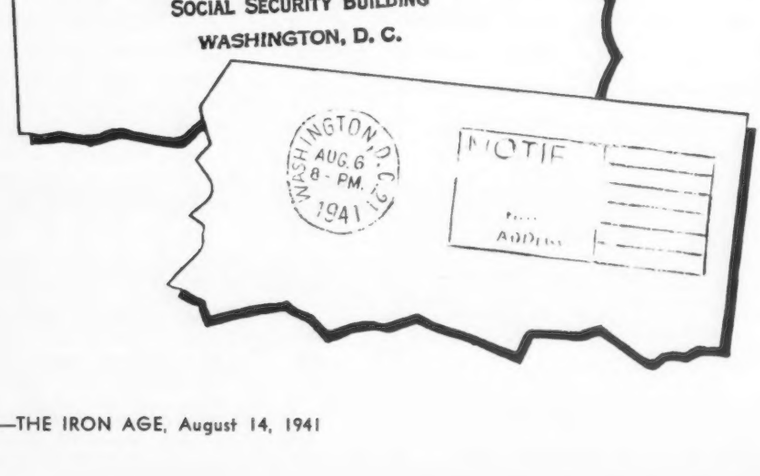
Full text of steel priorities order appears on page 91. Form PD-73 published on pages 81A-81B.

U. S. Steel in July Shipped 1,666,667 Tons Finished Steel

• • • United States Steel Corp. reports July shipments of finished steel by its subsidiary companies of 1,666,667 net tons. This represents a decrease of 1970 tons from the June figure of 1,668,637, and an increase of 369,780 tons over the 1,296,887-ton shipments of July, 1940.

For the first seven months of 1941, shipments were 11,719,544 net tons, compared with 7,585,285 tons in the comparable period of 1940, an increase of 4,134,259 tons.

TIME TURNED BACKWARD ON PD-69—Postmark shown here was on envelope from OPM containing form PD-69, upon which pig iron users are required to show their orders. The envelope was received by an eastern foundry. The post mark is Washington, Aug. 6. According to the original priority order, the form was to be filled out and returned by Aug. 5, a day before the foundry received it. Later, OPM set the dateline for filing the form back to Aug. 20.



7 Months Steel Output 63% Above 1917 Total

• • • Steel production in July totaled 6,821,682 net tons, bringing the amount produced in the first seven months of this year to the record breaking total of 47,730,225 tons, or 63 per cent above production in the comparable period of 1917, according to the American Iron and Steel Institute. July output was 19 per cent over the 5,724,625 tons turned out in July, 1940.

While last month's output was slightly above the 6,800,730 tons produced in June, weekly production and the rate of operations showed a decline from the June figures. This, the institute reports, reflects the increasing shortage of scrap steel, as well as the effect of the July 4th holiday.

Weekly production declined from 1,585,252 tons in June to 1,543,367 tons in July, the lowest for any month since December, 1940. The operating rate for the industry last month, 95.6 per cent, was likewise the lowest for any month since last December. It compares with an operating rate of 98.2 per cent for June, and an average of 98.0 per cent for the first six months of this year.

moves iron and steel products from the General Metals Order No. 1, which established an inventory control system.

"Within the past few months," Mr. Stettinius said in his letter to steel producers and purchasers, "there has arisen a condition within the steel industry which has seriously hampered the delivery of steel products in the amounts, and at the time, necessary for defense purposes, and which makes it essential that steps be taken to insure from now on that our defense program shall not be delayed because of failures to obtain steel at the proper time.

"With the demand for steel for all purposes increasing, and with total demand for immediate delivery being now greater than the ability of the steel industry to produce and deliver to the satisfaction of all customers, it is necessary that action be taken to insure deliveries for defense above all other deliveries. This order is designed to accomplish this result."

Steel Mills Must Analyze Many Thousands of Orders

• • • Some steel leaders are still rubbing their eyes after reading paragraph b 13-1 in the new steel order which seems to require that a form PD-73 will be necessary for all orders or contracts placed prior to Sept. 1, 1941, by Oct. 15. If this sentence means what it says it will require the stupendous task of attempting to analyze more than one million orders which constitute unfilled orders within the steel industry.

According to special instructions, Par. 13, it would appear that no producer shall make and no person shall accept delivery of steel after Oct 15 on all orders placed prior to Sept. 1, unless the customer who put in these orders has furnished the steel producer with a statement on form PD-73. Steel leaders are wondering how the unfilled orders can be explained on a form before Oct. 15.

Also causing some apprehension is the form which the Director of Priorities will furnish for the report to be submitted by the steel industry each month and which is to include records of all orders received and shipments made during the month as well as the unfilled orders as of the last day of the month. Even if such a form only requires recapitulation by groups and product steel classification the job is expected to be tremendous.

Steel Mill Schedules May Be Upset By Order

Cleveland

• • • Strict application of the sequence of deliveries provisions in the mandatory steel order without the use of common sense and without the realization that rolling mill schedules are so intricate and delicate that undue disturbance of them would result in chaos, would actually bring about a retardation in national defense steel production, according to steel authorities here.

One thing certain here is that steel business not carrying a rating cannot possibly be filled for the time being.

Steel Makers Seen Taken off the Spot

Pittsburgh

• • • On Monday and Tuesday of this week steel companies were still holding meetings with production and sales officials going over and thrashing out details on the mandatory steel priority order but first reaction here was that the steel industry has been taken "off the spot." Before the mandatory order was issued, steel companies were under tremendous pressure from their customers to accept all the business offered while the steel companies themselves were endeavoring and despite obstacles were succeeding in getting out defense business first.

Before the order was issued the fulfillment of defense business was more or less on a voluntary basis and, according to steel companies, it was difficult to convince some customers that rolling mill schedules were jammed with defense requirements. The steel priority order now definitely places defense needs ahead of all non-defense uses, and according to some steel sources this should make it exceedingly clear to customers that unless the latter have a preference rating, chances of obtaining material are very slight for the time being at least.

Steel companies expect those consumers who have not seen fit to obtain preference ratings as yet to precipitate a grand rush on Washington in an effort to get such ratings. It is said here that some customers with defense business have been relatively negligent in obtaining official ratings.

Steel companies here are appalled by the amount of paper work demanded in the steel priority order. It is said to be almost a practical impossibility to supply OPM each month with a complete list of orders and shipments as well as a complete list of unfilled tonnage. The job of preparing Form PD73 on all orders for contracts placed prior to Sept. 1, 1941, is believed by officials here to be well nigh impossible of attainment by Oct. 15, or, for that matter, within any time if total effort is to be given over to production of steel.

••• All Steel Users Required to File

PD-73

(This Form may be Reproduced)
OFFICE OF PRODUCTION MANAGEMENT
Iron and Steel Branch
Washington, D. C.

CUSTOMER'S STATEMENT TO PRODUCER CLASSIFYING PURCHASE ORDER OR CONTRACT FOR STEEL

This Statement must be attached to every order or contract placed with a Producer for carbon and alloy steel castings, ingots, blooms, slabs, billets, forgings and all other semi-finished and finished rolled or drawn carbon and alloy steels, as covered in Order M-21, issued August 9 , 1941 by the Director of Priorities.

All steel covered by this Statement is to be for only one "Group Classification" as defined in the "Instructions for Form PD-73".

To _____ _____
Name of Producer Address

From _____ _____
Name of Customer Address

Type of business _____

Order No. _____ covers material in "Group" _____
(Give Group Title)

Date _____ Is order for stock? Yes ☐ No ☐ Group letter ____

Shipping date(s) required _____

Completion date of contract for which material is required _____

Ultimate use (as detailed as possible) _____

Insert in Column (#1) each product included in this order according to "Product Classification" as defined in the "Instructions for Form PD-73", and insert in Column (#2) CORRESPONDING TONNAGE FOR EACH PRODUCT. If alloy steel, insert "a" after number.

(#1) Products	(#2) Net Tons	(#1) Products	(#2) Net Tons	(#1) Products	(#2) Net Tons	Total-Col. #2
						(Net Tons)

CERTIFICATE

The undersigned hereby certifies to the Producer and to the Division of Priorities Office of Production Management, that:

(1) he executed the foregoing statement on behalf of and by authority of the above-named customer;
(2) the customer has not placed an order for steel in any form with any source of supply which will duplicate the requirements of the order to which this statement is attached;
(3) the facts stated herein are, to the best of his knowledge and belief, true and correct;

(Date) (Signature of Authorized Official) (Title)

(Section 35 of the Criminal Code, 18 U.S.C. 80, makes it a criminal offense to make a false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.)

The Producer shall preserve this statement for not less than two years for audit and inspection by Office of Production Management.

This Form—PD-73—With Mills •••

INSTRUCTIONS FOR FORM PD-73

In filling out Form PD-73, use the proper Group and Product(s) Classifications listed below. All steel covered by one statement is to be for only one group classification. (NOTE. The certified statement is sent to the steel producer with your order and not to the Office of Production Management).

GROUP CLASSIFICATION

(The letters used to designate the following groups are not to be construed as preference ratings).

Group A. Army-Navy
Contracts, commitments, or purchase orders for products to be delivered to or for the account of the Army or Navy of the United States. (Include in this group PD-3 Preference Rating Certificates and direct Army or Navy Contracts)

Group B. Maritime-U. S. Agencies
Contracts, commitments, or purchase orders for products to be delivered to or for the account of the United States Maritime Commission, the Panama Canal, the Coast and Geodetic Survey, the Coast Guard, the Civil Aeronautics Authority, the National Advisory Commission for Aeronautics, the Office of Scientific Research and Development. (Include in this group PD-4 Preference Rating Certificates and direct contracts from the various Government Agencies herein listed).

Group C. Lend-Lease
Contracts, commitments, or purchase orders for products to be delivered to or for the account of the Government of Great Britain and the government of any other country whose defense the President deems vital to the United States. (Include in this group orders placed by the Procurement Division, United States Treasury, which bear the symbol "DA" on the order form).

Group D. Priorities Division
Contracts, commitments, or purchase orders to which the Director of Priorities assigns a preference rating of A-10 or higher. (Include in this group all PD-2 Preference Rating Certificates or blanket ratings issued by the Priorities Division and all other Defense Orders as defined in General Preference Order M-21 which are not included under Groups A, B, C, E, and F).

Group E. Other Export
Contracts, commitments, or purchase orders for products to be exported from the United States and not included under Group C, above. (Include in this group all orders for export which are not in Group C).

Group F. Warehouses
Contracts, commitments, or purchase orders for delivery to warehouses for resale from their stock. (Include in this group, and in no other, all sales to warehouses).

Group G. OPACS
Contracts, commitments, or purchase orders for products covered by any Civilian Allocation Program which may be determined by the Office of Price Administration and Civilian Supply. (Include in this group only "B" ratings).

Group H. All other
Contracts, commitments, or purchase orders for products not included in Groups A to G, above. (Include in this group all orders which cannot be specifically identified as being in Group A to G, inclusive).

PRODUCT CLASSIFICATION

Place in Column (#1) code number(s) listed below to identify Product(s) covered by order.

(1) Ingots, Blooms, Billets, Slabs, Tube Rounds and Sheet and Tin Bars	(6) Tie Plates and Track Accessories Including Track Spikes	(11) Pipe and Tubes	(16) Sheets and Strip Hot Rolled	(21) Wheels and Axles
(2) Structural Shapes and Piling	(7) Hot Rolled Bars Carbon, Including Hoops and Bands	(12) Wire Rods	(17) Sheets and Strip Cold Reduced	(22) Forgings Armor Plate and Ordnance
(3) Plates (Universal & Sheared)	(8) Hot Rolled Bars Concrete Reinforcing	(13) Wire and Wire Products Including Fence Posts	(18) Sheets and Strip Galvanized	(23) Forgings All Other
(4) Rails Over 60 lbs.	(9) Hot Rolled Bars Alloy	(14) Black Plate	(19) Sheets and Strip All Other	(24) Steel Castings
(5) Rails All Other	(10) Cold Finished Bars (Carbon & Alloy)	(15) Tin & Terne Plate (Hot Rolled and Cold Reduced)	(20) Tool Steel Bars	(25) Skelp (26) All Other

OPM Pig Iron Order Causes Wide Confusion

Pittsburgh

• • • **Unprecedented** confusion in the pig iron industry is slowly but surely building up here as consumers and producers attempt to readjust their activities to conform with OPM's general preference order M17 which established full priority control over pig iron.

Out of the confusion, however, one inescapable fact is emerging —that pig iron consumers without defense business are, for the time being, "out of luck." A large measure of the confusion arises from the short time granted both consumers and producers to digest the order and adjust themselves to it. For instance, the order was dated Aug. 1 and consumers are required to return form PD69, listing their orders, by Aug. 5. Too, iron on order is to be identified according to standards of the American Iron & Steel Institute, yet many foundries have no copy of these standards and none was attached to the official order.

Recognizing the impossibility of either producers or consumers complying with the dates established in the original order, OPM late last week set the deadline for the reports back 10 to 15 days. Customers now have until Aug. 20 to obtain preference ratings and supply proper forms which had previously been demanded by Aug. 5. The proposed pig iron shipment schedules for September, which were supposed to have been submitted by producers to OPM no later than Aug. 15, are now to be submitted prior to Aug. 25. These extensions in the deadline apply only to the September orders. All forms covering October orders must be filed by the dates specified in the original order. Meanwhile, the pig iron industry's 3700 or more customers were this week frantically attempting to obtain preference ratings on their orders.

Steel makers are watching the present pig iron situation closely in view of the expectation that an order similar to M17 will soon be released covering steel products or at least some steel products. With producers not submitting pig iron production schedules for September until Aug. 25 and with September shipments bottled up until such schedules have been given proper approval by Washington, there is some speculation as to whether these schedules will be returned to pig iron makers in time to make shipment by Sept. 1.

Many pig iron producers will be forced to submit September shipping schedules before all of their customers have been able to comply with the priority order's provision and before many of them will have obtained priority ratings. This condition, it is said, will undoubtedly lead to a bottleneck at Washington where defense officials will have less than a week to determine which pig iron shipments can be made in September.

With the priority order not taking full effect until Aug. 20 instead of Aug. 5, as far as shipments this month are concerned, consumer pressure for supplies between now and Aug. 20 will be terrific, the "push" already being on this week. Such pressure, however, is expected to gain little or nothing in the way of supplies over and above what customers have been getting in the past.

When the pig iron order becomes fully effective it will be found to all intents and purposes that the OPM will be telling producers to whom pig iron may be shipped and it will also be found, according to authorities here, that the pig iron which has been placed in the pool will be smaller than generally expected and will be used only for emergency cases not taken care of by other provisions in the priority order.

↓ ↓

• • • **Repercussions of the** pig iron priority order in the Eastern seaboard area forced a practical cessation of all activities last week as producers and consumers struggled to interpret the official order. Some foundrymen expressed the opinion that the order was hastily drawn, with several factors overlooked.

Chief cause of the confusion was the fact that up to the end of the week most consumers were without copies of form PD-69 which, according to the official order, was supposed to be filed last Tuesday. New England foundries were only beginning to receive their forms late in the week. Connecticut foundries were advised by Washington that their forms had gone astray. Local OPM offices were of little assistance for as late as Friday they hadn't received any copy of PD-69. OPM, however, late last week, moved the deadline for filing these reports back to Aug. 20.

Adding to the confusion was the fact that consumers are required to report orders on the basis of American Iron & Steel Institute specifications which few foundries had or were acquainted with. No list of the specifications were attached to the order. It was also pointed out that the specifications do not cover charcoal or straight malleable iron.

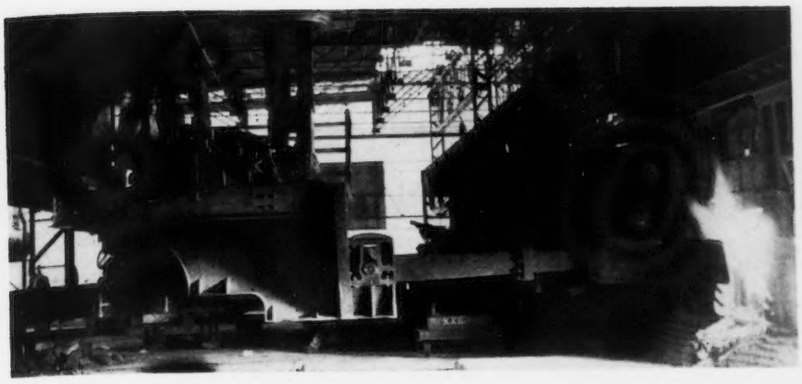
STEEL FROM BRAZIL: Production of steel at the Monlevade plant of the Companie Siderugical Belgo-Mineiro, Sabara, Minas Geraes, Brazil, will reach 120,000 tons yearly when two more blast furnaces and two open hearths now under construction are completed. This company, which owns two plants in Brazil, is owned by Brazilian, Belgian and Luxemburgian interests. It now is operating four blast furnaces and five open hearths, produces mostly wire, and is building a rail mill.

Ickes to O.K. Pipeline Priorities

Washington

• • • **Proposals for** obtaining priorities on materials and equipment needed in petroleum pipeline construction henceforth will be routed through Oil Coordinator Harold L. Ickes before being submitted to the OPM priorities division.

Under this arrangement Mr. Ickes already has been given a high priority rating for materials needed in the construction of a pipeline from Portland, Me., to Montreal, a line regarded by Administration officials as an integral part of the aid-to-Britain program.



. . . Charging machine of an open hearth furnace

. . . Wire drawing mill at Monlevade, Brazil

. . . Dr. Luis Ensch, general director, Belgo-Mineiro Co. Siderugical of Sabara, Minas Geraes, Brazil.

. . . Blooming mill at the Monlevade plant

. . . Wire stock room at Monlevade, Brazil

Government May Seize Struck Kearny Yards

• • • **With little likelihood** that officials of Federal Shipbuilding & Dry Dock Co. and Local 16 of the Industrial Union of Marine and Shipbuilding Workers (CIO) come to an agreement this week terminating the week-old strike at the company's Kearny, N. J., shipyards, it is probable that the government will seize the yards, Washington reports say. On Monday L. H. Korndorff, president of the company, proposed in a telegram to Frank Knox, Secretary of the Navy, that the Navy take over operation of the struck yards. It has been reported in Washington that a plan already has been drafted to place the plant under government control, with the union being granted a union shop, but no action is expected until after President Roosevelt's return from his holiday cruise.

Defense contracts totaling $450,000,000 are being held up by the strike, which involves 16,000 workers. Work has been stopped on one cruiser, six destroyers, two freighters and three oil tankers. Construction of a large wet basin and three shipways, however, was resumed by 500 AFL workers. with the approval of CIO union leaders. Mr. Korndorff claims the strike is a breach of the union's agreement made June 23, promising there would be no strikes in the shipbuilding industry on the Atlantic Coast prior to June 23, 1943.

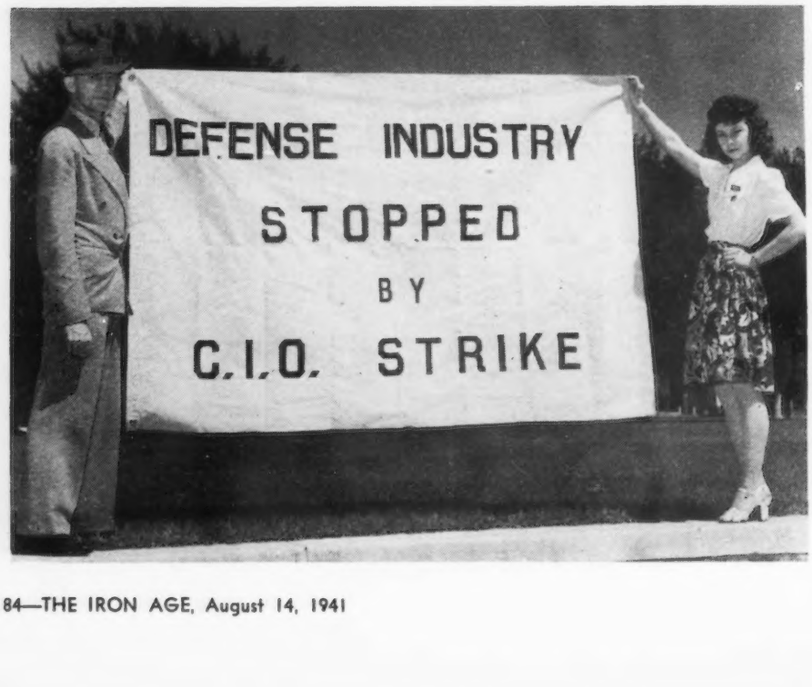
The principal point of contention is the "union shop," calling for discharge by the company of any union man who lets his membership lapse. Since its terms do not apply to non-union men, the strikers say it does not bring the closed shop question to Eastern shipyards. The same clause was embodied in a contract signed Monday by the **New York Shipbuilding Co.**, Camden, N. J., with Local 1 of the same union which is conducting the Kearny strike. John Green, national president of the union, called the contract, which affected 12,000 employees, "a model for other shipbuilders to follow."

Settlement of an overtime wage disagreement between **Drydock Associates** and AFL carpenters was proceeding through OPM mediation with workers returning to the building of two battleship drydocks at the Philadelphia Navy Yard, after one-day walkout.

At Curtiss-Wright Corp.'s Caldwell, N. J., propeller factory, work was stopped Friday morning by Aircraft Lodge 703, International Association of Machinists (AFL), in a controversy involving higher wages and changes in hours and working conditions. A National Labor Relations Board election held last Thursday was won by an independent union, Propeller-Craft, Inc., and company officials are awaiting certification of the union as bargaining agent for the 1,000 production men at the Caldwell plant and the 800 to 900 at the nearby Clifton plant, which are classed as a single unit. Strikers, who say the winning union is company controlled, plan to file charges with the NLRB alleging company interference in electioneering.

Aluminum Co. of America's New Kensington, Pa., plant was threatened with a strike, should mediation efforts of the United States Conciliation Service, called upon by Local 2 of the Aluminum Workers of America, fail. Ten cents an hour more for afternoon and night shift workers is wanted by the union. The demand has been the basis of company-union discussions for four years, N. A. Zonarich, international president of the union, said.

DISTRESS FLAGS: Not all strikes hampering the defense program are caused by the CIO, now run in partnership by Philip Murray and John L. Lewis, but Prof. Paul Keating, of the Colorado School of Mines, is offering to provide flags like that shown above to all defense plants tied up by CIO unions. Keating is holding one end of the flag. Many members of the CIO rank and file condemn defense strikes.



July Construction Awards Set New All-Time Record

• • • **Nearly one billion** dollars in new construction in one month is the record achieved by July engineering awards. The month's volume, $958,663,000, is the highest in the history of the construction industry, according to *Engineering News-Record*, and averages $191,733,000 for each of July's five weeks. The current month's weekly average awards are 30 per cent above the previous high reported for a month ago, and 120 per cent over the July, 1940, average week.

Public construction reached a new peak in July, and on the weekly average basis was 42 per cent higher than in June and 150 per cent above a year ago. Federal work, primarily for defense construction, is responsible for the high public volume and also reaches an all-time high. It exceeds a month ago by 65 per cent, and is 246 per cent higher than a year ago.

July Shipbuilding at High; Concrete Barge Construction Studied

• • • **During July, the volume** of ship construction now on the ways or on order reached a new high of 945 vessels of 5,833,570 gross tons, according to the American Bureau of Shipping. Of the 83 new vessels added to the bureau's list for the month, all but one were small craft, such as barges and towboats, with the largest group of new orders for 37 oil barges.

Eight merchant ships, aggregating 59,895 tons, were completed during the month, bringing the total for the first seven months of 1941 to 48 ships, of 386,684 tons, completed. Of these 32 were freighters, 13 tankers, and three passenger vessels.

↓ ↓

Washington

• • • **The Maritime Commission** last week awarded contracts to five companies for the construction of 45 cargo vessels. To be identified as "coasters," the vessels will require a total of 42,000 tons of steel. Awards went to these companies: Lake Superior Shipbuilding Co., Superior, Wis.; Leatham Smith Coal & Shipbuilding Co., Sturgeon Bay, Wis.; Odenbach Shipbuilding Co., Rochester, N. Y.; Basalt Rock Co., Napa, Cal.; and the Pacific Bridge Co., San Francisco.

The Commission, after conferring with representatives of the concrete industry last week, also took under advisement the possibility of building reinforced concrete tow barges designed for shipping oil, grain and other bulk commodities.

↓ ↓

San Francisco

• • • **Two West Coast firms** have announced tentative plans for construction of shipyards for the building of concrete vessels. Newport Shipbuilding Corp. proposes to build a yard in Southern California and Olympic Ship Construction Co. has announced plans for a $1,500,000 plant at Olympia, Wash.

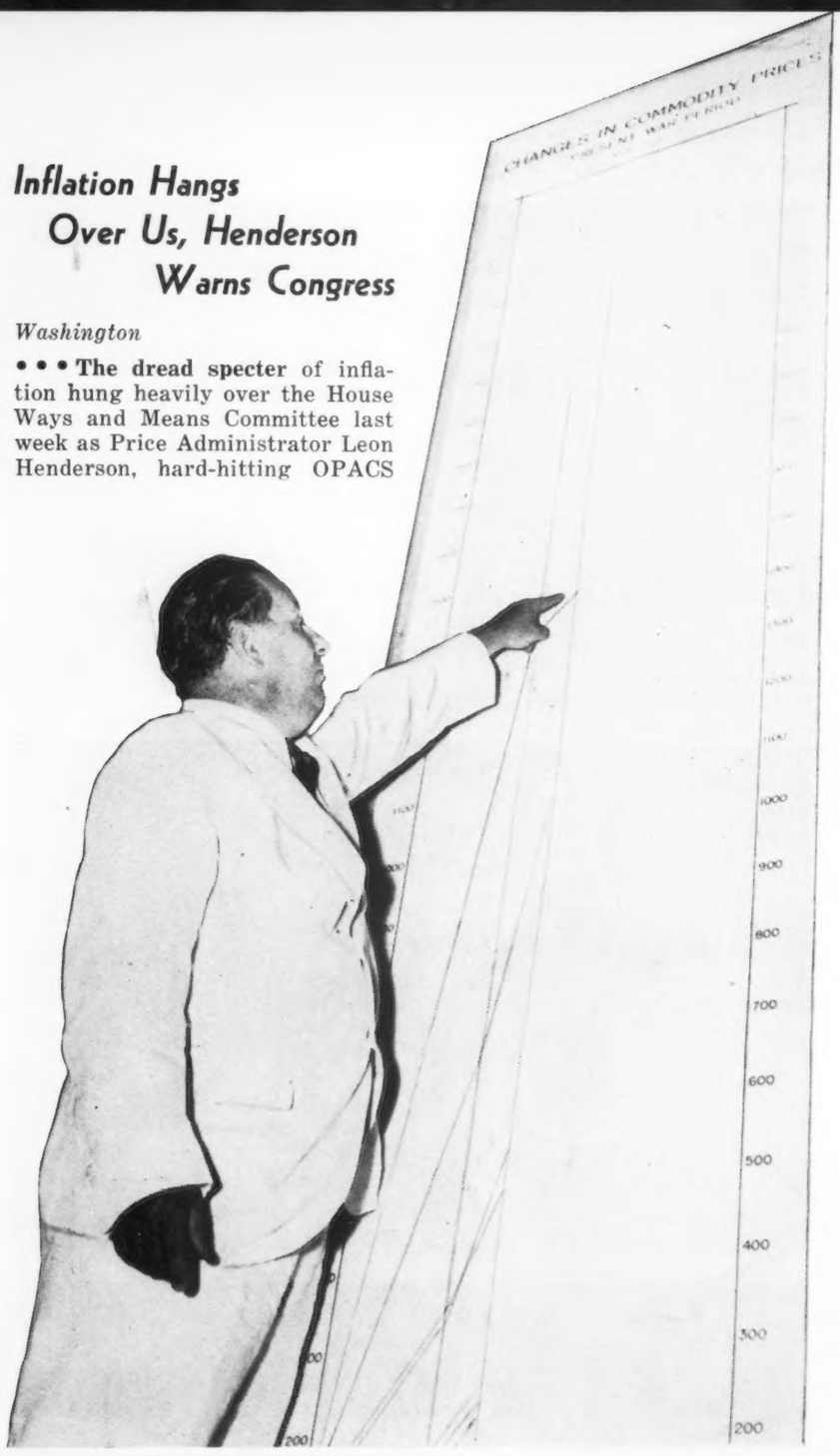
Photo by International

CLOSED SHOP: These pickets stopped autos at the main gate of Federal Shipbuilding & Drydock Co., Kearny, N. J., and with hundreds of others closed the Kearny yards which had been working on two desperately needed cruisers, six destroyers, three tankers and two cargo boats. Sixteen thousand men were idle. Their CIO leaders wanted the yards closed to all except union workers. The pickets threatened non-union workmen (top), waved placards (center) and explained (below) why they had tied up $493 million of Naval and merchant ship contracts.

Inflation Hangs Over Us, Henderson Warns Congress

Washington

• • • **The dread specter** of inflation hung heavily over the House Ways and Means Committee last week as Price Administrator Leon Henderson, hard-hitting OPACS generalissimo, depicted its damaging effect on wage-earner and farmer, attempted to sell committee members on the Administration's price control bill, and by implication sought to convince them that broader price-fixing power should be vested exclusively in Mr. Henderson.



10-FT. CHART: It took a 10-ft. chart for Leon Henderson, Price Control administrator, to show how rapidly commodity prices (not the prices of steel) are rising in the U. S. He testified before the House Banking and Currency Committee.

Despite his warning that the country stands on the brink of inflation, and that the inflationary aspect of prices made drastic steps necessary, committee members did not reflect Mr. Henderson's anxiety but appeared disposed to delay action until after the Labor Day recess. The committee's study of the problem may take six weeks.

Mr. Henderson's appearance before the committee culminated weeks of New Deal indecision and behind - the - scenes maneuverings on price control legislation, followed by an urgent message to Congress on July 30 in which the President conceded that existing machinery to regulate prices is cumbersome and ill-adapted to all circumstances likely to arise; that there has been evasion, bootlegging and open defiance of OPAC's price fixing orders.

The price administrator, who less than three months ago told the Chicago conference of the National Association of Manufacturers that "we have all the power which price fixing authorities had in World War days, and many, many more facilities," explained last week that for the most part business men had respected all OPACS price schedules issued to date, but that because of "some chiseling" it was necessary to ask Congress for direct and workable sanctions.

The "sanctions" referred to by Mr. Henderson are embodied in a 12-page bill that would give the President broad discretionary power to fix price ceilings on any commodity, principally on the basis prevailing on July 29, including the power to invoke a multiple price system. For reasons of political expediency the measure omits any provision on wage controls.

This omission prompted Chairman Henry B. Steagall, Democrat of Alabama, to ask the OPACS administrator to supply further information on the effect of wages on living costs. Committee members also were anxious to obtain from Mr. Henderson additional data on utility rates and farm prices. The provision setting a farm price ceiling 110 per cent of parity is regarded as the second big loophole in the measure.

To those industries whose prices already have been fixed or frozen by OPACS, the measure is primarily of interest because of the enforcement teeth proposed. Section 305, according to sponsors of the bill, provides for "well-rounded enforcement machinery." Indeed, this provision specifically permits the customary remedies by injunction or other civil suit, authorizes suits for recision or for treble damages, and stipulates that if a buyer fails to bring an action against the seller for violations, the government on its own

behalf may sue for treble damages.

Buyers who do not buy for their own use or consumption and who fail to bring such suit may be subject to prosecution for conspiracy to violate the law. As an alternative method of enforcement, the President would be authorized to issue or require licenses as a condition of engaging in any transaction with respect to which a regulation or order may be issued under the law.

Replete with white linen suit, long cigar, and 32 impressive-appearing charts, Mr. Henderson swaggered before the committee in driving home his arguments. Metals and building supplies, he said, are considerably behind the rate of price increase they underwent during the World War. He attributed this to existing government controls and the cooperation of producers.

One of the Henderson charts showed that during the first 22 months of the World War price advances amounted to 28 per cent in building materials; 52 per cent in metals and metal products; 23 per cent in chemicals; and only 10 per cent in farm products.

During the first 22 months of the present war, prices were shown to have increased 13 per cent in building materials; 6 per cent in metals and metal products; 14 per cent in chemicals; and 24 per cent in farm products.

Forecasting shortages for the balance of the year in many commodities needed for defense industries, the price administrator listed in this category pig iron, zinc, aluminum, brass, cadmium, nickel, magnesium, neoprene, and others. He also predicted a shortage of freight cars in a few weeks, but qualified this remark with the statement that fast loading and unloading of cars will permit the October peak to be met.

During recent months there has developed in Congress a growing hostility to Mr. Henderson. Some members have been irked by his approach in seeking passage of a price control bill. There has been some talk of establishing a five-man board to administer a revamped price agency, and relegating the OPACS administrator to the status of a mere member. At the same time, sentiment for appointing Bernard M. Baruch, head of the War Industries Board during the World War, to head all existing defense agencies, including the price fixing organization, has swept through Capitol Hill.

Throughout his testimony, Mr. Henderson persistently linked his name with that of Mr. Baruch. He made it clear to committee members that President Roosevelt and Mr. Baruch were responsible for the choice in making him OPACS administrator. He emphasized, too, that he was appearing before the committee because of these two men, both of whom had a wealth of experience in the last war.

Mr. Henderson, who has occasionally referred to his brief Washington experience as an Army officer during the World War, related that Mr. Baruch once told him that if he had it to do over again he would not spend so much time trying to reach an agreement with all concerned before establishing price ceilings, meanwhile letting prices run. If Congressional members accept this advice, they will be slow to set up a price fixing board as an alternative for the present one-man control exercised by Mr. Henderson.

The bill up for consideration at the hearing makes no mention of an administrative agency except that it empowers the President to delegate his price fixing authority to any department, agency, officer or employees of the government.

While Mr. Henderson attributed the inadequacy of present price controls to some "chiselers," industry representatives who have worked closely with the Henderson organization place the blame on OPACS itself, charging maladministration.

Even as Mr. Henderson was testifying before the committee last week, Edwin C. Barringer, executive secretary of the Institute of Scrap Iron & Steel, alleged that three price schedules on scrap have "progressively confused the situation." This is the way Mr. Barringer summarized his experience with OPACS:

Adjustments promised the scrap trade on July 11 were delayed because lawyers at OPACS disagreed with the economists; the institute has been compelled to recall interpretations issued by OPACS' legal division because of this disagreement; and Mr. Henderson, over the institute's objection, has given special rights and privileges to some of the 15 brokers about whom he complained in asking for a Justice Department investigation of the scrap iron and steel trade.

BATTLESHIP ANCHOR CHAIN: Visitors to Cheltenham's (Eng.) "Give Your Iron Railings" campaign found this section of a British battleship anchor chain exhibited as one of the articles which railings can provide for the war effort.

Photo by British-Combine

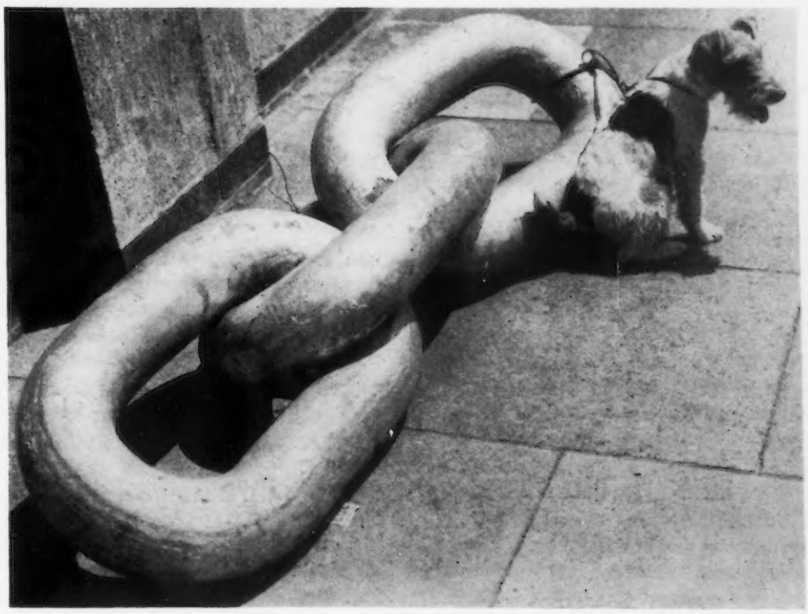


Photo by Wide World

LOADING A TRENCH MORTAR: A cadet at the Brazilian military school loads a trench mortar during exercises at the school (at Rio de Janeiro) which is patterned after West Point.

Repairs, Maintenance Get Priority Rating

Washington

• • • **A new maintenance and repairs rating plan,** under which nine industrial classifications of essential industries will be given A-10 rating applicable on orders for essential repair and maintenance parts, was issued last week by the OPM priorities division. The classifications include railroads, coke converters, metallurgical plants producing metals and alloys, mines, public utilities and common carrier passenger transportation including airlines, and plants producing explosives.

Producers in these classifications are not automatically entitled to the A-10 rating, it was explained, but must first make application to the maintenance and repairs section, OPM priorities division. A special emergency rating of A-1-a may be assigned in cases of extreme emergency upon receipt of telegraphic applications.

The plan, according to Edward R. Stettinius, Jr., director of priorities, is expected to benefit not only essential industries but also aid some suppliers and producers in qualifying under the defense supplies rating plan.

As part of its civilian allocation program, OPACS accorded priority status for similar services early in July, although the classifications were not identical to those just announced by OPM.

New England Hardware Men Hit by Defense Shortages

• • • **New England hardware manufacturers,** jobbers and retailers are beginning to feel the government drive to conserve certain metals. Aluminum goods manufacturers are out of the picture or nearly so, with those heretofore having a line of 100 items down to eight. The government has taken everything obtainable in the wood screw line. Despite the zinc shortage, some hardware jobbers have ample galvanized ware supplies; others nothing.

The government wants every fire extinguisher the country can produce and the hardware trade has to go without as a result. Price brackets for tools requiring chromium are soaring. Wire fencing supplies are dwindling rapidly with little likelihood of being materially increased soon.

New OPM Committee To Tackle Auto Cut

Washington

• • • **A passenger car sub-committee,** whose members will play an active part in the controversial subject of production curtailment in the automobile industry, has been appointed at the request of James S. Adams, chief of the OPM automobile industry branch. According to OPM Director General William S. Knudsen, it is Mr. Adams who will have the final word in determining the extent of automobile curtailment for the new model year.

Members of the committee, a sub-division of the automotive defense industry advisory committee, include:

I. T. O'Brien, vice-president, Chrysler Corp., Detroit; R. C. Cosgrove, vice-president and general manager, Crosley Corp., Cincinnati; H. Murray Northrup, chief engineer, Hudson Motor Car Co., Detroit; G. W. Mason, president, Nash-Kelvinator Corp., Detroit; Thomas W. Skinner, Ford Motor Co., Dearborn, Mich.; Donaldson Brown, vice-chairman, General Motors Corp., Detroit; J. W. Fraser, president, Willys-Overland Motors, Inc., Toledo; William Packer, vice-president, Packard Motor Car Co., Detroit, and Paul G. Hoffman, president, The Studebaker Corporation, South Bend, Ind.

War Department Surveys 500 Plants in Mid-west

• • • **A War Department survey** of 500 firms in Cleveland, Dayton, Detroit, Chicago and St. Louis is expected to bring many new plants in the category of defense manufacturers.

Army procurement officers, naval officials, and OPM representatives recently completed a swing through the midwest in an effort to get first-hand information on converting durable goods manufacturing facilities into munition producers. The plants surveyed turn out agricultural machinery, aluminum ware, cutlery and edged tools, hardware, refrigerators, stoves, ranges, furnaces, hand tools and a wide range of other products.

Scrap Price Schedule Is Revised by OPACS

Washington

• • • **In the midst of the** current controversy over the cause of the shortage of steel scrap, the Office of Price Administration and Civilian Supply last week announced a number of minor changes in its schedule of maximum prices for iron and steel scrap.

The revisions add a number of new basing point prices, permit higher prices on some secondary items in Pittsburgh, Ashland, Ky., Birmingham, the West Coast, Duluth and New England, change the method of computing export prices at Gulf ports and eliminate Minnequa, Colo., as a basing point for railroad scrap. The new amendments also modify existing shipping point prices for dealers' yards located within basing points.

The new basing points are Conshohocken, Pa., Minneapolis, St. Paul, Atlanta, Ga., Alabama City, Ala., and Portland, Ore.

Chief price changes were the advancing of low phos material at Pittsburgh. The following electric furnace items there were advanced $1.75 a ton: low phos punchings and plate scrap, both grades of ordinary punchings and plate scrap, heavy axle and forge turnings and medium heavy electric furnace turnings. Stove plate at Worcester, Mass., Bridgeport, Conn., and Phillipsdale, R. I., was raised $3.50 a ton. An increase of $1 a ton was ordered at Duluth on these grades: No. 1 cupola, heavy breakable cast, stove plate, machinery cast cupola size, No. 1 machinery cast drop broken and clean auto cast. Prices on electric furnace grades were established for West Coast points which previously were not basing points for such material. Stove plate is no longer based on Minnequa, Colo. Mixed borings and turnings, machine shop turnings, shoveling turnings and cast iron borings can now be sold on a Toledo base, while Birmingham has been made a base on shoveling turnings.

The export price of $15 a ton for No. 1 heavy melting steel at Gulf ports has been eliminated and instead prices for the Gulf points are to be calculated as for other export points as in the past, thus making the computation of export prices identical at all United States ports.

The new amendments differentiate between shipping point prices at shipping points located within basing points and shipping points located outside basing points. In the case of shipping points within basing points, the price is the basing point price, less transportation from the shipping point to the nearest consumer's plant in the basing area.

For shipping points located outside basing points, computation of the shipping point price is unchanged except the price at all shipping points in New York, Brooklyn, and New Jersey, in which, by reason of barge rates, are nearest in terms of transportation to Buffalo must in the future be computed from the Bethlehem, Pa., basing point.

This last revision is believed to be designed to correct a situation existing in the New York area whereby purchases for export to Canada through Buffalo by barge could be bought above the level prevailing for domestic shipments to Eastern Pennsylvania mills.

IDEALIZED TANK: At Berwick, Pa., this snowwhite tank last week carried a girl dressed in white, with flowers in her hands. It was the 1000th tank to be made by American Car & Foundry Co. for the U. S. and Britain. It has 2685 kinds of parts and 14,318 individual pieces exclusive of engines and accessory equipment. ACF officials said "the first thousand tanks are the hardest."

Furniture Makers Discuss Sheet Shortage With OPM

Washington

• • • **A growing** shortage of steel sheets requiring the substitution of wood in many types of furniture was under discussion last week at an OPM meeting of furniture manufacturers. Industry representatives, who voted to name an informal industry advisory group, conferred with John M. Brower, OPM furniture consultant, and discussed simplification of lines and the possibility of diverting facilities to defense production.

Favoritism Claim Against OPM Is Studied By Senate

Washington

• • • **Award of a $13,411,864** Army contract to Willys-Overland Co. for 16,000 quarter-ton reconnaissance trucks—better known as "jeeps"—prompted a special Senate committee this week to investigate charges of favoritism in the OPM and allegations that training of Army cavalry units has been "seriously hampered" by time lost in getting the vehicles into full production.

Francis H. Fenn, president of the American Bantam Car Co. of Butler, Pa., told the committee that although his organization had gone through the "growing pains" of original design and development and received the first educational order for 70 pilot models, he was advised at one time by John D. Biggers, OPM production chief, that the Bantam company was "small and weak" and that OPM doubted its ability to produce cars.

The Pennsylvania company, Mr. Fenn said, subsequently was given a further order, cleared by Mr. Biggers, after assurances had been given that additional sources of supply would be developed by placing orders with other automobile companies. The Ford Motor Co., and Willys-Overland were then given orders for the fast, light vehicle that has captured the imagination of expert and amateur military strategists, the testimony showed.

Despite government assurances that the policy would be to distribute orders between the three companies, it awarded the contract for 16,000 units to Willys-Overland Co., a development which Mr. Fenn described as "a direct turnabout." Because his company, currently engaged in assembling 1077 vehicles, has torn down its assembly line in favor of a "jeep" assembly line, and retained key employees at the War Department's suggestions, the recent bid sought on an "all or none basis" came as an extreme shock to Bantam.

Senator Harry S. Truman, committee chairman, who has been investigating charges of alleged irregularities in awarding defense contracts, declared that there are "a lot of little plants that are not running that don't have representation on OPM and I am trying to find out why they can't get some business."

Also read into the record during the hearing was a letter, signed by Major General Herr, Chief of Cavalry, who charged that valuable time was being wasted in getting the badly needed reconnaissance vehicle into full production, and that training of cavalry units has been "seriously hampered" thereby.

Bethlehem Worker Accused Of Sabotage by FBI

Allentown, Pa.

• • • **Nicholas Kozul,** 24-year-old hammer operator at the Bethlehem, Pa., plant of Bethlehem Steel Co., is being held in $2,500 bail by the Federal Bureau of Investigation on the charge of obstructing national defense work at the steel plant.

Kozul is accused of throwing steel grit into an electric furnace motor on May 31. The grit caused the motor to catch fire and delayed production for about an hour. The F.B.I. said that Kozul expressed dissatisfaction with his job because he had not been transferred to another job by his departmental foreman.

Sloss-Sheffield Opening Alabama Brown Ore Mines

Birmingham

• • • **Sloss-Sheffield** Steel & Iron Co., Birmingham, announced Aug. 11 that the company had started work on developing two new brown ore mines in northwest Alabama to increase pig iron production. Cost was estimated at $350,000. Sloss, which has three brown ore mines in operation, expects to obtain about 360,000 tons of brown iron ore annually from the two new mines. One mine is scheduled to be in operation by Sept. 1, the second by the middle or latter part of September. They will be of the strip mine type, employing about 75 men each.

Railroad Purchases Show Slight Decline

• • • **With rail equipment** builders' books laden with heavy orders assuring operations at the peak point of capacity permitted by the availability of supplies, some moderation in new orders and inquiries continues. In the past week, 23 locomotives and 1230 freight cars were ordered, as compared with the previous week's total of 38 locomotives and 2022 freight cars. In addition, New York, New Haven placed a 20,000-ton rail order.

The largest locomotive order was placed by Central Railroad of New Jersey, which called for 10 diesel-electric units. Electro-Motive Corp. will supply two 1000-hp. and two 600-hp. locomotives; Baldwin Locomotive will furnish four 600-hp. units; and American Locomotive will build two 600-hp. units. The Louisville & Nashville has ordered eight diesel-electric 4000-hp. passenger locomotives from the Electro-Motive Corp.; Wabash has ordered two 600-hp. diesel-electric switching units, one each from the Electro-Motive Corp. and Baldwin Locomotive Works; the Pennsylvania has ordered from Baldwin Locomotive one steam turbine passenger locomotive and tender, while one steam freight locomotive and tender will be built in the railroad's own shops; one 1000-hp. diesel-electric locomotive has been ordered from Electro-Motive Corp. by the Philadelphia, Bethlehem and New England.

Bethlehem Steel and Carnegie-Illinois Steel have shared equally in a 20,000-ton rail order placed by New York, New Haven & Hartford, calling for early 1942 delivery. The Delaware, Lackawanna & Western may soon enter the market for its 1942 requirements which may approximate 10,000 tons.

McCormick Auto Price Executive for OPACS

Washington

• • • **Appointment of** Cyrus McCormick, former vice-president in charge of manufacturing of the International Harvester Co., has been named price executive of OPACS's automobile and truck section.

June Sheet Output Drops 9.7% Plate Production Gains

• • • **Reflecting efforts** to convert the nation's sheet mills to producing plates for ships and other defense work, sheet production in June declined to 93.8 per cent of capacity from 103.9 per cent in May, a decline of 9.7 per cent. according to the American Iron and Steel Institute. Plate production in June advanced to 92.2 per cent from 91.9 per cent in May.

Total output of steel for sale in June declined to 5,086,210 tons or 100.4 per cent of capacity from 5,084,847 or 104 per cent in May. While the shorter work period in June accounted for part of the month's decline in tonnage output, it did not completely account for the percentage loss. (Steel ingot production in June was at 98.2 per cent of capacity.

Notable declines on a percentage basis in June, see accompanying table, were recorded in structural shapes, steel piling, bars and cold rolled strip and sheets. In addition to plates, both hot and cold rolled tin plate showed gains, the largest advance being registered by cold rolled tin plate. Exports also increased about 10,000 tons in June.

AMERICAN IRON AND STEEL INSTITUTE
Capacity and Production for Sale of Iron and Steel Products

June - 1941

		Number of companies	Items	Annual Capacity Net tons	Production for Sale—Net Tons: Current Month: Total	Current Month: Per cent of capacity	Current Month: Shipments: Export	Current Month: Shipments: To members of the industry for conversion into further finished products	Year to Date: Total	Year to Date: Per Cent of capacity	Year to Date: Shipments: Export	Year to Date: Shipments: To members of the industry for conversion into further finished products
Steel Products	Ingots, blooms, billets, slabs, sheet bars, etc.	35	1	xxxxxxx	415,375	xxx	43,070	168,297	2,939,207	xxx	580,840	944,106
	Heavy structural shapes	8	2	4,948,200	372,884	91.6	9,460	xxxxxxx	2,203,149	89.7	91,556	xxxxxxx
	Steel piling	4	3	422,000	26,798	77.2	2,358	xxxxxxx	177,255	84.7	14,186	xxxxxxx
	Plates—Sheared and Universal	19	4	6,168,590	467,843	92.2	19,245	2,194	2,715,602	88.7	199,088	13,298
	Skelp	8	5	xxxxxxx	88,875	xxx	22,528	36,295	529,946	xxx	91,877	216,794
	Rails—Standard (over 60 lbs.)	4	6	3,613,600	152,433	51.3	12,211	xxxxxxx	933,695	52.1	44,355	xxxxxxx
	Light (60 lbs. and under)	6	7	302,800	11,946	47.9	2,063	xxxxxxx	93,096	62.0	33,814	xxxxxxx
	All other (Incl. girder, guard, etc.)	2	8	102,000	3,207	38.2	359	xxxxxxx	13,034	25.8	1,858	xxxxxxx
	Splice bar and tie plates	15	9	1,300,200	61,076	57.1	1,330	xxxxxxx	388,558	60.2	9,663	xxxxxxx
	Bars—Merchant	35	10	xxxxxxx	495,780	xxx	24,680	56,522	3,182,801	xxx	276,439	356,880
	Concrete reinforcing—New billet	16	11	xxxxxxx	125,889	xxx	14,346	xxxxxxx	716,830	xxx	111,309	xxxxxxx
	Rerolling	17	12	xxxxxxx	19,388	xxx	1,770	xxxxxxx	87,259	xxx	6,683	xxxxxxx
	Cold finished—Carbon	19	13	xxxxxxx	100,600	xxx	1,510	xxxxxxx	607,682	xxx	10,821	xxxxxxx
	Alloy—Hot rolled	16	14	xxxxxxx	139,451	xxx	10,548	10,618	833,719	xxx	73,771	75,782
	Cold finished	16	15	xxxxxxx	15,928	xxx	1,467	xxxxxxx	95,782	xxx	11,339	xxxxxxx
	Hoops and baling bands	5	16	xxxxxxx	11,722	xxx	546	xxxxxxx	54,740	xxx	2,236	xxxxxxx
	TOTAL BARS	53	17	12,193,785	908,758	90.6	54,867	67,140	5,578,813	92.2	492,598	432,662
	Tool steel bars (rolled and forged)	16	18	127,870	10,505	99.8	568	xxxxxxx	55,669	87.7	3,921	xxxxxxx
	Pipe and tube—B. W.	13	19	2,049,200	124,035	73.6	10,996	xxxxxxx	764,733	75.2	62,529	xxxxxxx
	L. W.	8	20	885,260	42,916	58.9	2,526	xxxxxxx	240,220	54.7	16,570	xxxxxxx
	Electric weld	4	21	466,020	47,071	122.8	1,242	xxxxxxx	222,979	96.4	12,612	xxxxxxx
	Seamless	15	22	3,003,840	184,886	74.8	24,862	xxxxxxx	1,043,796	70.0	105,812	xxxxxxx
	Conduit	6	23	152,145	12,569	100.4	255	xxxxxxx	68,450	90.7	1,180	xxxxxxx
	Mechanical Tubing	12	24	461,725	37,527	98.8	2,525	xxxxxxx	233,634	102.0	21,892	xxxxxxx
	Wire rods	19	25	xxxxxxx	117,624	xxx	11,851	19,727	755,100	xxx	80,911	129,022
	Wire—Drawn	37	26	2,291,250	195,281	103.6	14,513	1,599	1,100,259	96.8	79,403	11,055
	Nails and staples	19	27	1,120,610	65,254	70.8	7,834	xxxxxxx	411,907	74.1	37,693	xxxxxxx
	Barbed and twisted	16	28	458,210	23,151	61.4	5,193	xxxxxxx	142,471	62.7	32,720	xxxxxxx
	Woven wire fence	15	29	771,180	28,031	44.2	195	xxxxxxx	168,761	44.1	1,112	xxxxxxx
	Bale ties	10	30	110,980	8,553	93.7	-	xxxxxxx	40,641	73.8	99	xxxxxxx
	All other wire products	5	31	24,280	593	29.7	-	xxxxxxx	3,248	27.0	-	xxxxxxx
	Fence posts	13	32	136,195	6,569	58.6	55	xxxxxxx	37,000	54.8	534	xxxxxxx
	Black plate	11	33	341,235	36,082	128.5	3,684	-	203,059	119.9	16,657	43
	Tin plate—Hot rolled	7	34	352,700	26,670	91.9	2,311	xxxxxxx	138,301	79.0	9,878	xxxxxxx
	Cold reduced	10	35	3,520,640	265,073	91.5	23,107	xxxxxxx	1,371,975	78.5	120,784	xxxxxxx
	Sheets—Hot rolled	24	36	xxxxxxx	586,368	xxx	20,648	15,585	3,815,570	xxx	160,206	112,419
	Galvanized	14	37	xxxxxxx	125,279	xxx	9,761	xxxxxxx	880,777	xxx	62,935	xxxxxxx
	Cold rolled	16	38	xxxxxxx	236,959	xxx	7,068	xxxxxxx	1,652,661	xxx	35,585	xxxxxxx
	All other	14	39	xxxxxxx	66,130	xxx	2,102	xxxxxxx	406,981	xxx	11,626	xxxxxxx
	TOTAL SHEETS	27	40	13,154,510	1,014,736	93.8	39,579	15,585	6,755,989	103.5	270,352	112,419
	Strip—Hot rolled	23	41	3,200,380	174,802	66.4	6,445	21,151	1,037,368	65.3	40,151	134,260
	Cold rolled	34	42	1,385,260	102,257	89.7	1,322	xxxxxxx	601,687	87.5	9,304	xxxxxxx
	Wheels (car, rolled steel)	5	43	422,825	20,934	60.2	61	xxxxxxx	127,078	60.6	299	xxxxxxx
	Axles	4	44	472,280	14,208	36.6	492	xxxxxxx	86,111	36.7	1,374	xxxxxxx
	Track spikes	11	45	327,275	15,776	58.6	250	xxxxxxx	90,071	55.5	1,668	xxxxxxx
	All other	4	46	24,100	1,912	96.4	-	xxxxxxx	11,401	95.4	79	xxxxxxx
	TOTAL STEEL PRODUCTS (a)	134	47	xxxxxxx	5,086,210	xxx	327,557	331,988	31,284,263	xxx	2,587,387	1,903,659
	Pig iron, ferro manganese and spiegel	24	48	xxxxxxx	619,530	xxx	54,981	214,836	3,792,447	xxx	280,757	1,144,992
	Ingot moulds	4	49	xxxxxxx	61,395	xxx	778	xxxxxxx	363,039	xxx	1,931	xxxxxxx
Iron Products	Bars	9	50	109,196	7,046	78.4	4	623	32,832	60.6	20	2,036
	Pipe and tubes	3	51	109,300	5,735	63.8	315	xxxxxxx	32,456	59.8	1,204	xxxxxxx
	All other	2	52	71,000	1,450	24.8	488	-	9,249	26.3	1,669	-
	TOTAL IRON PRODUCTS (ITEMS 50 to 52)	11	53	224,995	14,231	76.9	807	623	74,537	66.8	2,893	2,036

Total Number of Companies Included - 151

(a) Reported by Companies which in 1940 produced 96.5% of that year's total output of Finished Rolled Products.

The estimated average yield of products for sale from ingots produced by the companies included above is 71.1%, *which applied to their total ingot capacity equals* 57,546,000 *net tons of finished rolled products. Production for sale, less shipments to members of the industry for further conversion, related to the estimated yield is as follows:*

Current month 4,754,222 *N. T.;* 100.4 %
Year to date 29,290,604 *N. T.;* 102.6 %

Wright Resigns to Join Charles Dreifus Co.

C. E. WRIGHT

Vice-President, Charles Dreifus Co.

T. W. LIPPERT

Managing Editor, THE IRON AGE

J. A. ROWAN

News & Markets Editor, THE IRON AGE

• • • **C. E. Wright,** who has been a member of the editorial staff of THE IRON AGE, for 21 years, the past five years as managing editor, is leaving this publication to become vice-president of the Charles Dreifus Co., Philadelphia and Pittsburgh, one of the leading brokers in iron and steel scrap.

Mr. Wright first joined this publication in 1917 and remained until 1933, when he became connected with the Republic Steel Corp. in its New York sales office. He returned to THE IRON AGE as managing editor in July, 1936. Previous to 1917 he had been engaged in daily newspaper work in Detroit, Toledo and Minneapolis and for three years was a member of the editorial staff of *Hardware Age,* an affiliated publication, as Western editor in Chicago and associate editor in New York.

During his many years with THE IRON AGE Mr. Wright has won recognition as an authority on marketing practices in the iron and steel industry. He has made an intensive study of the marketing of iron and steel scrap and conducted for the Institute of Iron and Steel Scrap the first nation-wide survey of scrap consumption, a work which has since become a regular feature of the service which the United States Bureau of Mines performs for industry.

The Charles Dreifus Co., with which Mr. Wright becomes associated, has been engaged in the selling of iron and steel scrap for 40 years. Upon the retirement of Charles Dreifus from active participation in the business a few years ago, the principal office was moved from Pittsburgh to Philadelphia and Hiram Winternitz, Jr., who has been engaged in the scrap industry in Philadelphia for 30 years, became president and Walter S. Gates, treasurer. Mr. Wright will make his headquarters at the company's home office in the Widener Building, Philadelphia.

• • • **T. W. Lippert,** newly appointed managing editor of THE IRON AGE, joined the organization in 1932 as associate editor, later becoming technical editor.

Mr. Lippert was educated at the Carnegie Institute of Technology, Pittsburgh, receiving the degrees of B.S. and M.S. in Physics. Later he was an instructor in physics and carried out graduate research work and published several papers dealing with electromagnetic phenomena in ferrous alloys Mr. Lippert came from Carnegie Tech to the New York offices of THE IRON AGE.

Prior to graduating from college Mr. Lippert was employed by the Follansbee Brothers Steel Co., at its Toronto works; by the Macbeth-Evans Glass Co., Charleroi, Pa.; and was on the engineering staff of the State of Ohio, located at Steubenville, Ohio.

• • • **J. A. Rowan,** who this week was named news and market editor of THE IRON AGE, became associated with THE IRON AGE in 1937 following wide newspaper and magazine experience. Educated at Sibley College of Engineering, Cornell University, Mr. Rowan had industrial experience including positions with Youngstown Sheet & Tube Co., Republic Steel Corp. and Sharon Steel Corp.

In 1925 he became managing editor of the Brazilian-American magazine at Rio de Janeiro, in 1926 a correspondent in Brazil for the Chicago Tribune, and in 1936 managing editor of The Youngstown Telegram, a Scripps-Howard newspaper. In 1937 Mr. Rowan joined the Pittsburgh Press as labor editor, covering the early efforts of the CIO to organize the steel industry. At various periods he has written on industrial, financial and other subjects for the Wall Street Journal, Barron's, Time magazine, and various other publications, including the New York World-Telegram and the old New York World.

Complete Text of Mandatory Priority Orders for Steel

• • • **The full text** of the order (M-21) issued by the OPM Priorities Division, placing steel under a full mandatory priority control system, effective Aug. 9, 1941, follows:

(1) "Steel" means all carbon and alloy steel castings, ingots, blooms, slabs, billets, forgings, and all other semi-finished and finished rolled or drawn carbon and alloy steels.

(2) "Person" means any individual, partnership, association, corporation, or other form of enterprise.

(3) "Producer" means any person who produces steel, as herein defined.

(4) "Defense Order" means:

(i) Any contract or order for material or equipment to be delivered to, or for the account of:

1. The Army or Navy of the United States, the United States Maritime Commission, the Panama Canal, the Coast and Geodetic Survey, the Coast Guard, the Civil Aeronautics Authority, the National Advisory Commission for Aeronautics, the Office of Scientific Research and Development;

2. The Government of Great Britain and the government of any other country whose defense the President deems vital to the defense of the United States under the Act of March 11, 1941, entitled "An Act to Promote the Defense of the United States."

(ii) Any other contract or order to which the Director of Priorities assigns a preference rating of A-10 or higher.

(iii) Any contract or order placed or offered by any person for the delivery of any material or equipment needed by him to fulfill his contracts or orders on hand, which material or equipment is required for the fulfillment of any contracts or orders included under (i) and (ii), above.

(b) **Directions as to Deliveries.** Deliveries of steel by any producer or any other person shall be made only in accordance with the following directions:

(1) **A-10 Assigned to Certain Defense Orders.** Deliveries under all Defense Orders to which a preference rating of A-10 or higher has not been specifically assigned are hereby assigned a preference rating of A-10.

(2) **Sequence of Preference Ratings.** Preference ratings in order of precedence are: AA, A-1-a, A-1-b, etc., . . . A-1-j; A-2, A-3, etc., . . . A-10, etc., AA being the highest rating presently assigned.

(3) **Doubtful Cases.** Whenever there is doubt as to the preference rating applicable to any delivery, or as to whether a particular order is a Defense Order, the matter is to be referred to the Division of Priorities for determination, with a statement of all pertinent facts.

(4) **Sequence of Deliveries.**

(i) Every delivery under a Defense Order shall be made in preference to deliveries under other orders whenever, and to the extent, necessary to fulfill the delivery schedule provided in the Preference Rating Certificate covering such delivery, or in the contract, commitment, or purchase order if no Certificate has been issued. Deliveries bearing no preference rating or lower preference ratings shall be deferred to the extent necessary to assure these deliveries bearing higher preference ratings, even though such deferment may cause defaults under existing contracts, commitments, or purchase orders. Each person who has Defense Orders on hand

THIS WEEK'S Priorities and Prices

(OPM)—All forms of **iron and steel** placed under full priority control on Aug. 9.

(OPACS)—Minor changes in schedule of ceiling prices on **scrap iron and steel** announced Aug. 8. Export pricing method also revised.

(OPM)—Ceiling price of 12c. a lb. for **copper** established Aug. 12. Full priority control over the metal was instituted in previous week.

(OPM)—New **field offices** are opened at Los Angeles, Seattle and Kansas City.

(OPM)—Copper and zinc industry defense advisory committee is formed. Membership consists of 35 leaders of non-ferrous industry.

(OPM)—Campaign to speed up **junking of old cars** to bolster scrap steel supply will be extended to New England. One trial campaign is already under way in Ohio.

(OPM)—Seeks to find employment for 3600 workers from **Chevrolet Buffalo plant**, which has been closed down for retooling for aircraft engine production. Retooling will take six months.

(OPM)—Steel companies are asked to **expand bessemer steel** use to counteract shortage of scrap steel. Blast furnace operators asked to submit proposals for air conditioning or enlarging existing furnaces. Requests were part of effort to increase pig iron and steel supplies.

(OPACS)—Approval of the **St. Lawrence Seaway and Power** project is voiced by Leon Henderson. Important to national defense, he said.

(OPACS)—Steel for 1942 automobile **license plates** given preferential treatment as part of civilian allocation program.

(OPM)—Repair and maintenance parts used by railroads, coke converters, metal and alloy producing plants, mines, public utilities, airlines and passenger transportation units have been given an A-10 priority rating.

(OPM)—Furniture makers discuss use of wood to meet sheet steel shortage; will name industry committee.

(OPM)—New committee appointed to study problem of **automobile production** curtailment.

(OPM)—Requests for priorities coming from the **petroleum industry** are to be handled by Oil Coordinator Harold Ickes. OPM will act on Ickes' recommendations.

(OPM)—A nine-member committee to represent **cast steel valve** manufacturers has been appointed. Group will act in advisory capacity only.

(OPM)—Manufacture of **white sidewall tires** prohibited effective Aug. 23. Move will save 6000 tons of crude rubber annually.

(OPACS)—Cyrus McCormick has been appointed **price executive** of the automobile and truck section.

must so schedule his production and deliveries that deliveries under Defense Orders will be made on the dates required, giving precedence in case of unavoidable delay to deliveries bearing the higher preference ratings.

(ii) The sequence of deliveries bearing the same preference rating shall be governed by the delivery dates specified in the respective Preference Rating Certificates assigned thereto, or if the ratings were assigned by order or direction of the Director of Priorities, but no Certificates were issued, then by the dates specified in the contracts, commitments, or purchase orders. In any case where preference ratings and delivery dates are the same, and it is impossible to make all deliveries on schedule, the matter is to be referred to the Division of Priorities for determination.

(5) **Delivery Schedules.** No earlier delivery date shall be specified in any Defense Order than required by the production or delivery schedules of the person placing the Defense Order. No preference rating will be assigned to any contract, commitment, or purchase order specifying delivery dates earlier or quantities greater than required by the production or delivery schedules of the person placing the contract, commitment, or purchase order.

(6) **Use of Material Obtained Under Allocation or Preference Rating.** Any person who obtains a delivery of steel under an order or specific direction of the Director of Priorities, or a delivery of such material bearing a preference rating, must use such material, or an equivalent amount thereof, for the purpose specified in connection with the issuance of the order, direction, or rating.

(7) **Acceptance of Defense Orders.** Defense Orders for steel, whether or not accompanied by a Preference Rating Certificate, must be accepted and fulfilled in preference to any other contracts, commitments, or purchase orders for such material, subject to the following provisions:

(i) Defense Orders shall be accepted even if acceptance will render impossible, or result in deferment of:

(A) Deliveries under non-defense orders previously accepted; or

Song Declared Not Injurious To CIO

Milwaukee

• • • Workers at the Allis-Chalmers plant have to be careful in their choice of songs while at work. As the result of a little ditty from the throat of an Allis-Chalmers employee, the Department of Labor conciliation service sent an arbitrator to decide whether the melody contained words detrimental to the CIO-UAW union in the plant. He ruled there was nothing in the song derogatory or interfering with shop discipline, found the offending workman a faithful employee and learned the company did not object to paying him unemployment compensation after his discharge. He may even get back pay.

The AFL branch of the UAW last week inserted advertisements in Milwaukee newspapers appealing for union members.

(B) Deliveries under Defense Orders previously accepted bearing lower preference ratings, unless rejection is specifically permitted by the Director of Priorities.

(ii) Defense Orders need not be accepted:

(A) If delivery on schedule thereunder would be impossible by reason of the requirements of Defense Orders previously accepted bearing higher or equal preference ratings, unless acceptance is specifically directed by the Director of Priorities; or

(B) If the steel ordered is not of the kind usually produced or capable of being produced by the person to whom the Defense Order is offered; or

(C) If the person seeking to place the Defense Order is unwilling or unable to meet regularly established prices and terms of sale, but there shall be no discrimination against Defense Orders in establishing such prices or terms of sale; or

(D) If such Defense Orders specify deliveries within twenty-one days, and if compliance with such delivery dates would require the termination or alteration before completion of a specific production schedule already commenced, but this provision shall not authorize rejection when such schedule can be terminated or altered without substantial loss to the producer.

(8) **Rejected Orders and Deferred Deliveries.** When a Defense Order for steel has been rejected or delivery thereunder has been unreasonably or improperly deferred in violation of this Order, the person seeking to place such order or obtain such delivery may file with the Division of Priorities a verified report in the form to be prescribed by the Division of Priorities, setting forth the facts in connection with the rejection or deferment. When the facts set forth justify such action, the Director of Priorities will thereupon direct the person against whom complaint is made to submit a sworn statement, setting forth the circumstances concerning the alleged rejection or deferment. Thereafter, such action will be taken by the Director of Priorities as he deems appropriate.

(9) **Civilian Deliveries.** Subject to the limitations and restrictions contained in this Order and after satisfaction of all Defense Orders, deliveries under any other contracts, commitments, or purchase orders may be made.

(10) **Intra-Company Deliveries.** The prohibitions or restrictions contained in this Order shall, in the absence of a contrary direction, apply not only to deliveries to other persons, including affiliates and subsidiaries, but also to deliveries from one branch, division, or section of a single business enterprise to another branch, division, or section of the same or any other business enterprise owned or controlled by the same person.

(11) **Effect of Order: Damages.** The prohibitions or restrictions contained in this Order shall, in the absence of a contrary direction, apply to all deliveries made after the effective date of this Order, including deliveries under contracts, commitments, or purchase orders accepted either prior to or subsequent to such effective date. No person shall be held liable for damages or penalties for any default under any contract, commitment, or purchase order which results directly or indirect-

(CONTINUED ON PAGE 107)

Personnel Shifts Mark English Output Drive

London

• • • **Sir Andrew Duncan,** former head of the British Iron and Steel Federation, has relinquished his Cabinet position as Minister of Supply and has been appointed president of the Board of Trade. The new Minister of Supply, Lord Beaverbrook, now becomes responsible for the manufacturing of arms and equipment for the army. His drive for intensive production methods will be concentrated there as, for more than a year, it was concentrated on aircraft production. Trevor Westbrook, who was appointed in June, 1941, to take control of all aircraft purchases from America and Canada, a post now held by F. C. Devereux, will be connected with the new Army equipment drive.

These government changes were announced almost simultaneously with changes of executives in the iron and steel industry calculated to make for greater industrial efficiency. Sir Walter Benton Jones, chairman of the United Steel combine, has been appointed managing director of the combine as well. He replaces N. H. Rollason, who has resumed his duties as managing director of John Summers & Sons, Ltd. D. N. Turner, the present managing director of the Staveley Coal & Iron Co., is to be made chairman upon retirement of Sir William Bird, in September. H. H. Berresford is to succeed Mr. Turner as managing director. At the recent annual meeting of John Brown & Co., Ltd., it was announced that Sir Allan J. Grant, managing director of Thos. Firth & John Brown, Ltd., has rejoined the board.

Metal Specialty Builds Office

• • • **The Metal Specialty Co.,** here, makers of pressed metal and injection plastic molding has completed a new air-conditioned office building adjoining its plant. Fluorescent lighting and sound proofing are used throughout the one story gray building. Officers of the company are Vernon B. Chase, president; Harvey Johnson, vice-president; and Arnold Tietig, III, treasurer.

Photo by Wide World

BRITISH MINISTER: Britain's 1941 invasion of the U. S., headed by Lord Halifax, this week was strengthened in its efforts to get a still greater flow of defense goods from U. S. industry by Sir Ronald Campbell (above), newly-arrived British minister.

Plastics, Pushed As Metal Substitute, Now Restricted

• • • **After months** of effort by government defense officials to sell industry on the necessity of turning to plastics as a substitute for metals, a shortage of plastics, synthetic resins, and their components has developed; and OPACS has launched a program to restrict their use.

The program segregates into three classifications the non-defense uses of molding compounds, plastics, adhesives and miscellaneous binders made from synthetic resins; and gives senior preference to industrial equipment, grinding wheels and other abrasive products, industrial light, heat, power and water equipment; trucks, tractors, farm equipment; technical instruments and other products.

Secondary preference is assigned to passenger automobiles, radio receiver cases and household appliances.

Charges Britain Sells Lease-Lend Tin Plate in S. A.

Washington

• • • **Charges that shipments** of tin plate to Great Britain under the lend-lease bill have found their way into Argentina, where they allegedly sold at prices below those offered by American manufacturers in the same market, were made in the House last week by Representative Fred Bradley, Republican of Michigan.

Reminding his colleagues that under the priorities system tin plate consumers in this country are going without while England is receiving prompt service under the provisions of the lend-lease act, the Congressman added:

"England, if you please, has taken that tin plate—American tin plate—down into Latin-America, into the Argentine, and in one instance I know of is selling it to Argentine people at a price lower than American manufacturers can put that same tin plate in the Argentine.

"Thus you see we are on the one hand loaning money to the Argentine and the Latin-American countries to make better neighbors, to increase trade, and on the other hand we are sending tin plate to England which she in turn is using to undersell our market in Latin America, not only to continue her trade with Latin America, but to put America out of that trade."

Several weeks ago President Roosevelt was questioned at a press conference about similar reports but he promptly minimized the possibility, and expressed doubt that Britain would want to make a profit on American supplies furnished under the lend-lease law.

Last month the British Tinplate Controller granted manufacturers and merchants permission to export additional quantities of tin plate from stock. A previous order had allowed shipments of 50 per cent of current holdings. Last month's order, in contrast to the earlier one, made no reference to the quantity of tinplate likely to be involved. (See THE IRON AGE, July *17, page 86.)*

New Plants Reduce Connellsville (Pa.) Dependence On Coal

• • • **Although a fair share** of the economic support for this city and surrounding area is still contributed by coal mining and beehive coke production, some factors have entered the picture recently which seem to promise far more long-term stability than has ever been the case, according to local business leaders. At one time, before coking coal mines here became worked out and thus forced a shutdown of beehive coke ovens in the immediate vicinity, the town had been pretty much dependent upon one industry.

On March 15 of this year, however, the Anchor Hocking Glass Corp. started up one glass tank here, at the present time is operating three, and by Sept. 1 is expected to put in the fourth. These operations have produced 750 jobs. The Anchor Hocking Co. is now in the process of moving its closure division from long Island City, N. Y., to Connellsville. This division, which produces metal and plastic caps, is already operating about 15 per cent here and when movement of machinery is complete, will give work to approximately 450 employees. The company sold its Long Island City location to a plant making defense materials.

Total operations at both the glass and closure plants of Anchor Hocking will thus produce 1200 jobs which did not exist a year ago and thus is expected to take a good deal of the uncertainty out of the future for Connellsville. Even during future periods of depression, city officials look for relatively good operations at the closure plant since it is one of three, one being located on the Pacific Coast and the other in Canada. It is pointed out that with the manufacture of glass containers located in the same area as the production of closures, a balanced and sustained production can be looked for.

An interesting sidelight is found in the lack of living quarters, owing to the movement of 100 key officials and workmen from Anchor Hocking's Long Island City plant. Approximately nine new homes are under construction, 25 more have been pledged and local business interests have formed the Connellsville Housing Corp. which will probably build about 20 homes. Interesting is the fact that this local housing corporation, incorporated for $35,000, is seeking neither government aid nor FHA help.

A local silk mill which was shut down last week because of the government's edict on hosiery, threw 200 girls out of work, probably all of whom will be employed at the Anchor Hocking closure division.

Another sustaining influence here is the West Penn Power Co. which employs approximately 1200 workers. Here is located the system's meter department, where meters and transformers are repaired, the general store room which services the entire system, the general garage where repairs are made to all the company's cars, a billing department where all bills for the system are made, as well as division and district headquarters of the power company and general headquarters of the railways department.

Old Swedish Iron Mines Reopened

Washington

• • • A newly-organized company is reported in a dispatch to the Commerce Department to have started the operation of iron mines, abandoned for many years, in Northern Sweden.

The dispatch said that 25,000 tons of ore annually for the next three years is expected from the mines, and that capital for the new organization has been subscribed by directors of the Stora Langviks Steel Trust, exporter of substantial quantities of ore to Germany.

Old New York Mines Reopened By Hanna Co.

• • • **Growing demands of armor** plate makers for more high-grade iron have prompted the M. A. Hanna Co., Cleveland mining concern, to reopen the historic, 75-yr.-old Clifton ore fields of St. Lawrence County, New York, deposits unworked since 1870. Actual mining operations will be commenced in June, 1942, by the Clifton Ore Co., Inc., a Hanna subsidiary. Though other large steel companies are reported considering development of New York State iron ore deposits, none contemplates operations so soon. Construction work on the Clifton site is already under way.

Clifton's annual tonnage is expected to average over 300,000 tons of lump and "sinter" ore. The ore, a rich magnetite, is regarded by experts as having perhaps the lowest phosphorous content in the country.

The new Clifton Ore Co., Inc., carries on where the former Clifton Iron Co. left off back in 1870. The early development of the Clifton fields proved disastrous because the ore could not be smelted at the mines by the primitive equipment available. Over $1,000,000 was lost in that early venture.

Officers of the new Clifton company are: George M. Humphrey, president; G. N. Hickok, vice-president; E. E. Hunner, general manager; G. M. Cannon, assistant general manager, and Guy B. Hunner, mine superintendent.

Jones & Laughlin Steel Corp. has leased 3200 acres in St. Lawrence County, N. Y., for iron mining. *For details see page 90,* THE IRON AGE, *July 31, 1941.*

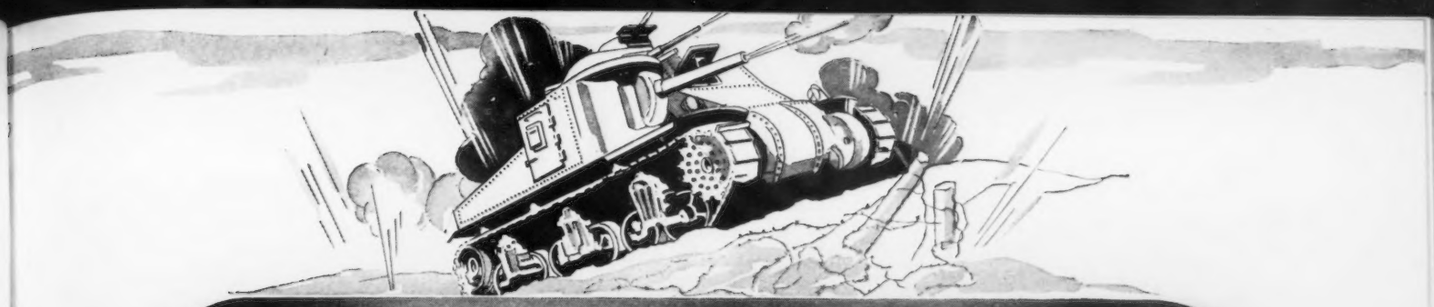
Defense Contract Service Opens Des Moines Office

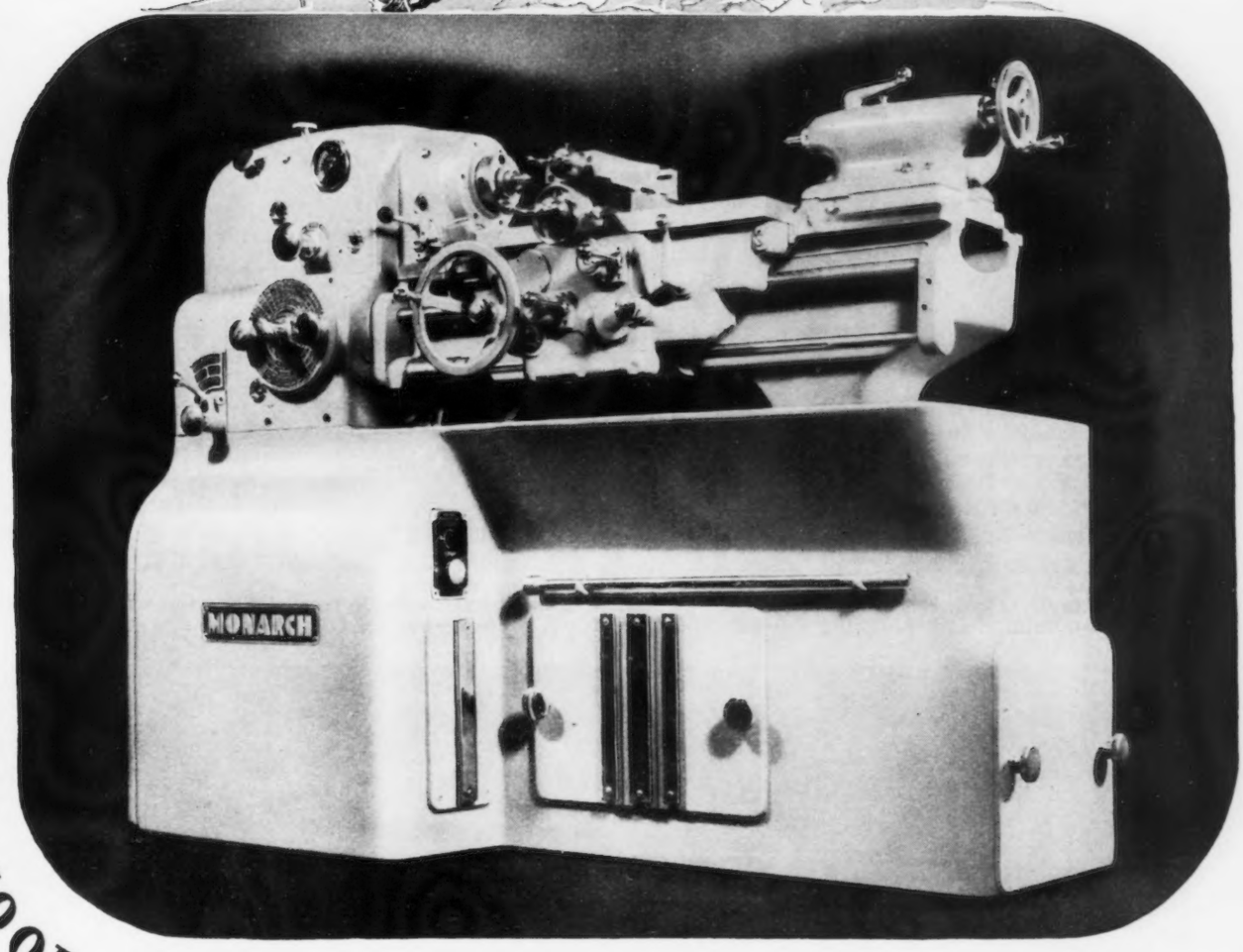
• • • **V. I. Clark of Penrod,** Jurden & Clark Co., Kansas City, has been appointed deputy coordinator, and George Beese of Fisher Governor Co., Marshalltown, Iowa, deputy manager, of the Defense Contract Service in Des Moines, opened Aug. 11.

10,808 Employees Earn Standard Oil Service Pins

Whiting, Ind.

• • • **A total of 10,808 employees** of Standard Oil Co. of Indiana will have been awarded gold pins, for 10 to 40 years service with the company, by the end of 1941. The combined years of service represented by those receiving the pins is 154,980 years.





THE TOOL ROOM...

Birthplace of Uncle Sam's 28-Ton "Babies"

These mighty land battleships, the M-3 medium tanks, are now rolling off production lines to take their places in America's new mechanized forces. But, before a single tread was laid or plate drawn . . . tools, jigs and dies had to come from the nation's toolrooms.

It is in these toolrooms that hundreds of Monarch 10″ x 20″ Sensitive Precision Tool Maker's Lathes are proving their mettle under the strain of accelerated emergency production. This remarkable Monarch lathe turns, bores and faces to an accuracy of .0001″, and chases threads to lead accuracy of .0005″ in 12 inches length. (To meet the constantly growing demand for this lathe, we have doubled its production since January 1st.) THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO.

MONARCH LATHES

Bethlehem Plans 132-in. Plate Mill

• • • **A 780,000-ton high speed** plate mill will be built at the Sparrows Point, Md., plant of the Bethlehem Steel Co. if recommendations of the Office of Production Management are followed. William S. Knudsen, Director General of OPM, wrote Jesse H. Jones, the Federal Loan Administrator, that the project was needed urgently for defense purposes and would require federal financing. Cost of the proposed facilities was estimated by the Bethlehem company at $23,097,000.

The proposed construction includes, in addition to the 132-inch continuous plate mill, an open hearth furnace with an annual capacity of 180,000 tons. Steel to operate the mill would be obtained from this furnace, three other company-financed open hearth furnaces now being completed, and additional furnaces existing at the plant.

Eugene G. Grace, president of Bethlehem, submitted the program to OPM as a part solution of the critical plate situation growing out of the Naval and merchant ship construction programs, railroad car building and other defense undertakings.

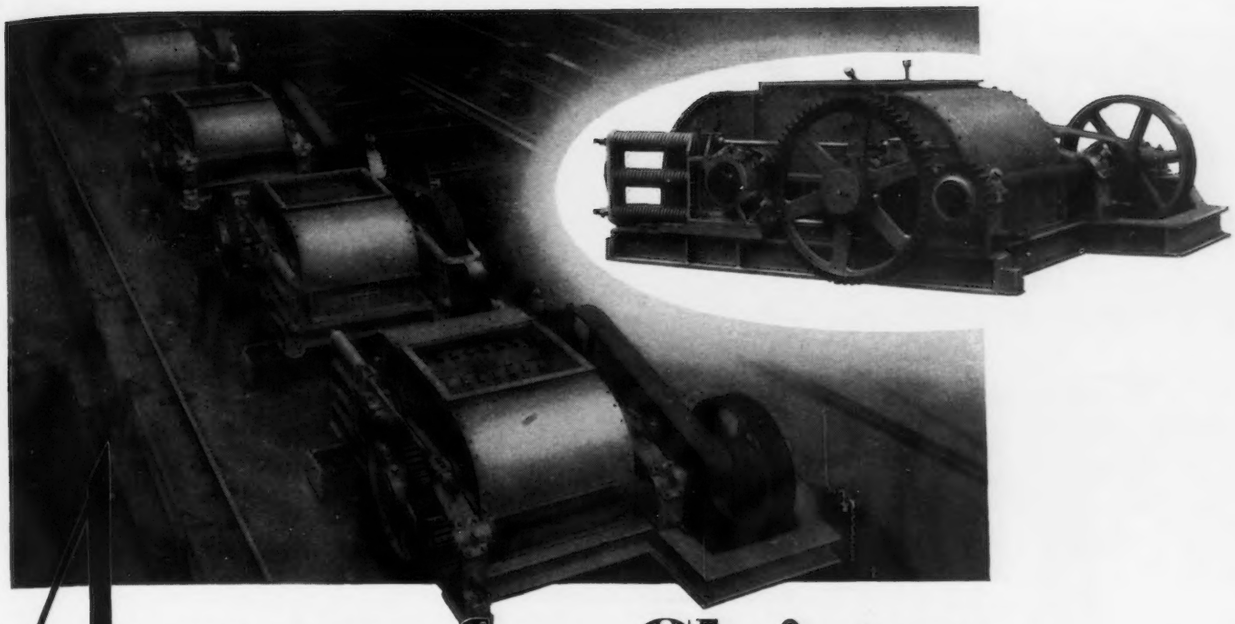
Present and prospective demands for plates are far in excess of existing capacity, demands are constantly increasing and delivery dates are long extended, Mr. Knudsen said in his letter to Mr. Jones. The Sparrows Point project would supply additional plates several months earlier than any other proposals submitted recently to the OPM, he added.

This is the third step recommended by OPM in its developing program to expand capacity of the steel industry. Previous recommendations covered expansion of armor plate and heavy forgings capacity of the Carnegie-Illinois Steel Corp., a subsidiary of the United States Steel Corp., and an initial expansion of 6,508,950 tons in the industry's annual pig iron capacity.

Wisconsin Accidents Soar; Untrained Workers Blamed

• • • **During the first half of 1941,** Wisconsin's industrial accidents increased 28 per cent over the same period in 1940, although employment has risen only 9 per cent. Many of the 13.827 accidents recorded this year under the workmen's compensation act are attributed to the onrush of untrained men into defense industry.

FRIANT DAM: Floodlights take the place of the sun at Friant Dam, in the Bureau of Reclamation's Central Valley project, California. By July 1, a total of 1,167,000 cubic yards of concrete had been poured in this structure.



4 more for Clairton

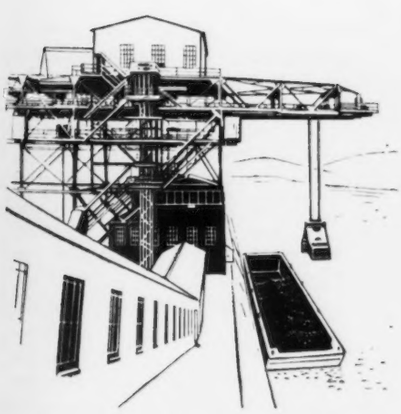
coal unloading towers 100% crusher-equipped

by Heyl & Patterson

At the By-Product Coke Works of the Carnegie-Illinois Steel Corporation, Clairton, Pa., four unloading towers lift huge tonnages of coal from river barges, where it is passed through heavy crushers and conveyed to the coke ovens.

With the installation of these four new crushing units all of the coal for this giant coke plant will be prepared by Heyl & Patterson crushers. That Carnegie-Illinois engineers, since the initial installation of Heyl & Patterson crushers in 1922, have twice recommended and installed additional crushers of the same design, is evidence that this equipment has performed to their complete satisfaction.

Why? Because Heyl & Patterson crushers are not a catalog item, but are specifically designed for each particular job. Because, like all Heyl & Patterson materials-handling and processing equipment, these crushers have built into them the extra sturdiness and reliability that assure continuity of operation and minimum maintenance.



Two Heyl & Patterson Unloading Towers were erected at Clairton in 1922, each with one H & P 42″ x 48″ double-roll coal crusher. In 1926 the capacity of these towers was doubled, when two H & P crushers were added. Now, four more are being furnished for two other towers, making a total of eight duplicate crushing units — *all by Heyl & Patterson.*

DESIGN • FABRICATION • ERECTION

LOADING and UNLOADING TOWERS — ORE BRIDGES
SKIP HOISTS — PIG CASTING MACHINES
SPECIAL CRANES — SPECIAL CARS — CAR DUMPERS
CAR HAULS — COAL and COKE HANDLING PLANTS
COAL TIPPLES AND PREPARATION PLANTS

HEYL & PATTERSON INC.

50 WATER STREET — PITTSBURGH, PA.

Grand Rapids

COMBINATION DRILL AND TAP GRINDERS

MODEL 10-B SHARPENS TAPS, 2, 3 and 4 Flute, Right or Left Hand. Sizes #6 to one and one half inches.

SHARPENS DRILLS, 2 and 3 Flute, Straight or Taper Shank. Sizes from one eighth to one and one half inches.

"Sharp Drills and Taps Cut Holes in Rising Production Costs."

Other Combinations also Available.

Write for complete descriptive literature.

GALLMEYER & LIVINGSTON CO.
303 STRAIGHT AVE. S.W.
Grand Rapids, Mich.

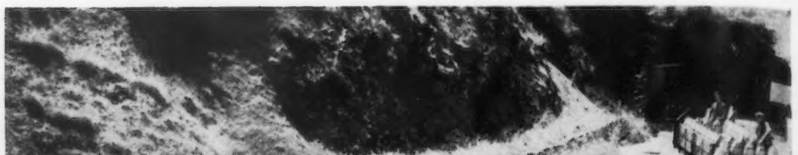


Photo by International

BOMB TRAIN: From a cache tunneled beneath a hill somewhere in England this train hauls a shipment of bombs sufficient to alter the face of a large industrial city.

Cast Steel Valve Makers Form OPM Advisory Group

• • • **A nine-member committee** to represent cast steel valve manufacturers has been appointed to work with OPM under the new advisory committee set-up created when OPM recently underwent a mild reorganization. To be known as the steel valve defense industry advisory committee, the group will consist of:

W. B. Holton, Jr., president, The Walworth Co., Inc., New York; Ernest Cochran, sales manager, Chapman Valve Mfg. Co., Indian Orchard, Mass.; J. P. Ferguson, sales manager, Reading-Pratt & Cady Co., Inc., Hartford, Conn.; O. F. Gang, vice-president, The William Powell Co., New York; Bernard J. Lee, Sr., vice-president, Jenkins Brothers, Bridgeport, Conn.; W. H. Pape, manager of sales, Valves and Fitting Division, The Crane Co., Chicago, Ill.; Charles W. Burrage, secretary, The Lukenheimer Co., Cincinnati; W. G. Swaney, general manager, Kerotest Mfg. Co.; Pittsburgh; and W. F. Crawford, president, The Edward Valve & Mfg. Co., East Chicago, Ind.

The OPM bureau of clearance of defense industry advisory committees also designated Carl M. Lynge, OPM Production division representative, as government presiding officer for the committee.

June Employment at Record High; 1,312,000 Over May

New York

• • • **Unemployment declined** from 3,848,000 in May to 2,536,000 in June, making an all-time employment high of 53,120,000, according to the Division of Industrial Economics of the National Industrial Conference Board. The June unemployment total was the smallest since June, 1930. Greater-than-seasonal gains in all fields of employment brought the month's total to 6,193,000 more than the number employed in June, 1940.

The number employed in manufacturing showed a contra-seasonal increase of 200,000 from May to June. Construction employed 333,000 more persons in June than in May and almost a million more than in June, 1940. The number employed on construction exceeded 3,000,000 for the first time since September, 1930. Almost half a million more persons were employed in agriculture than in May. There was an increase of 181,000 in the service industries, in which are included the armed forces. The service industries now employ more than 12,000,000, which is almost 2,000,000 more than in June, 1940. There were gains from May to June in the following groups: trade, distribution and finance, 101,000; transportation, 57,000; public utilities, 14,000; and forestry.

Machines Sought for Armor-Piercing Cores

Washington

• • • **A $1,725,000 expansion** program involving the addition of 150 screw machines and a small number of other machine tools has been approved by the War Department for the armor piercing core facilities of the St. Louis Ordnance Plant.

Operated by the McQuay Norris Mfg. Co., the plant turns out 0.30 and 0.50 caliber armor piercing ammunition cores. With the added equipment, it will be able to supply all armor piercing cores required for ammunition of this caliber produced at ordnance plants in Lake City, Mo., Denver, Colo., and St. Louis.

Of the ball, tracer and armor piercing types of small arms ammunition in use by the Army, the armor piercing variety is regarded as the most difficult to manufacture.

Export Licensing Covers Three More Tool Items

• • • **The State Department** has informed collectors of customs that three items in the category of metal-working machinery, previously exempt from the export licensing law, have been made subject to its provisions.

These items include portable tools driven by fractional horsepower motors or by compressed air; spare or replacement parts for machine tools; and portable welding equipment, single operator sets, gasoline or electric motor-driven, with capacity up to 600 amps.

Indiana Mine Strike Erases 35c. Wage Differential

• • • **A one-day unauthorized strike** affecting practically all Indiana mines was settled last week by abolition of the 35c. differential in basic wages between Indiana mines and those of other districts. About 5000 workers gain wage increases through the contract which is to run until March 31, 1943, and which was signed by the Indiana Coal Operators' Association and District No. 11, United Mine Workers of America.

The ***electrical*** *Industry*

. . . is one of the many key industries that have used and are using Heppenstall products—armature shaftings, bucket wheels for turbines, die blocks for forging parts and products, "tailor-made" forgings, shear knives for cutting metals, turbine shaftings, and Heppenstall Automatic Safe-T-Tongs for lifting materials. Heppenstall Co.

Heppenstall

HEPPENSTALL QUALITY

PITTSBURGH · DETROIT · BRIDGEPORT

Removal of Trade Group Men Explained

Washington

• • • **Trade association** executives, recently the subject of a purge in the ranks of OPM, were told last week by an OPM official that membership on the newly announced industrial advisory committees is "quite different from holding an official position as a representative of a government body."

Explaining that members of such committees merely consult and advise but do not initiate action, Sidney J. Weinberg, chief of OPM's bureau of clearance of defense industry advisory committees, told a gathering of trade association executives that the new advisory committee set-up will assure the maintenance of close contact with industry, bring maximum assistance, and facilitate industry's many and complicated dealings with government. It marked the first time that any OPM official had attempted to make a public explanation of the OPM policy of ousting trade association officials from its growing organization.

Mr. Weinberg, outlining the scope of activities to be engaged in by defense industry advisory committees, placed these limits on committee work:

An industry committee can (1) discuss freely any subject pertinent to the defense program; (2) furnish information on the industry when asked to do so by OPM; (3) give advice when so requested by a government official, and, (4) make recommendations. On the other hand, an industry committee can not (1) initiate action or determine policy for its industry; (2) compel any person to comply with a request or order issued by OPM, or, (3) make decisions for the OPM. Mr. Weinberg told the meeting that such a procedure has the approval of the Department of Justice and

Steel Defense Group Disbands

• • • More than a hundred executives of iron and steel companies representing all parts of the industry met Wednesday at the Waldorf-Astoria Hotel in New York and decided to discharge the Iron and Steel Industry Defense Committee which was named by the industry at a meeting in New York on May 7. All activities carried on under that committee were ordered discontinued.

The action was taken as a result of the recent appointment by the OPM of an Advisory Committee of 16 iron and steel executives, which will serve as an official aide to OPM in the defense program. It is expected that such activities of the former Defense Committee as the OPM desires to have continued will be carried on at the request of the OPM by the new Advisory Committee.

B. F. Fairless, chairman of the U. S. Steel Corp., was chairman of the Iron and Steel Industry Defense Committee, which was composed of 38 members.

LIGHTER GAUGE STAMPINGS, too

The versatility of our men and machines is limited only by the needs of those who entrust to us the important task of producing their stampings.

In the instance illustrated, a Tank Rim for an electrical transformer—16¾" long, 18⅛" wide and 5¼" deep—was stamped out of steel .075" thick. Yet each angle, arc, port and flange is clean and clear—and true to gauge.

Present your problems to Parish. The services of our engineers frequently result in economies of important proportions . . . yet their contributions are not evident in our costs.

Let us review your requirements.

PARISH PRESSED STEEL CO.

READING, PA.

PACIFIC COAST REPRESENTATIVE, F. Somers Peterson Co., 57 California St., San Francisco, Cal.

Photo by International

ARMY USE FOR CANS: Decontaminating a victim of mustard gas includes the dipping of the soldier into a can of chloride of lime solution, then into a can of water. Swabbing with clear, unleaded gasoline follows.

has been drawn up with the objective of avoiding possible infringement of the anti-trust laws.

Under Mr. Weinberg's outline of advisory committee machinery within the OPM, committees will only be named for a major industry and where that industry is recognized as having problems requiring "a whole series of actions that will need clearance in regard to the anti-trust laws." For the most part where those two conditions do not exist, OPM will try to get along without a committee.

Where no formal industry committee is set up, the plan is to call in an industry group for consultation and advice. In such an event, the general rules governing the use of formal industry committees hold good for informal group meetings; that is, industry representatives will discuss defense problems, submit data, make recommendations on request; decisions as to action will be made by the government.

Studebakers Start Machine Firm

Chicago

• • • **Two names familiar to the automotive** field have entered another branch of industry. J. M. Studebaker and his son, J. M. Studebaker, III, have formed the Studebaker Machine Co. to produce hydraulic vises, riveters and presses. Both were until recently directors of the automotive corporation that bears their name. The new company will operate under an exclusive license with Bryant Engineering Corp., Cicero, Ill., which owns the patents on the devices to be manufactured. Sales offices will be located in Chicago and executive offices in South Bend, Ind.

TAPPING SHELL FORGINGS
A TOUGH JOB made easier with Stuart's Thred KuT
PAT'D U. S. PATENT OFFICE
use Stuart's SOLVOL
LIQUID CUTTING COMPOUND
for turning!
• This new emulsifying cutting oil was developed especially for high speed turning jobs that require inspection-passing finish. It has higher cutting quality and rust preventative value than ordinary soluble cutting oils. Solvol Liquid Cutting Compound handles certain tapping and threading jobs that before needed a straight oil. Try it—you'll be pleased.
THERE is one sure way to simplify this and other tough jobs: Use STUART'S THRED-KUT, the cutting oil that solves the difficult cutting problems. Wide use by government armories, arsenals and by the aircraft industries recommends it! Put THRED-KUT to work for you NOW! You'll save time, money and headaches.
Write . . . wire . . . phone for trial drum. There is a Stuart engineer to help you on lubrication problems, without obligation.
SEND FOR the new Stuart 48 page handbook on Sulphurized cutting oils—it contains valuable information for anyone that has metal cutting problems. Please request on company letterhead.
Stuart Oil Engineering
Goes with every Barrel
For All Cutting Fluid Problems
D. A. STUART OIL CO.
Chicago, U.S.A. • LIMITED • Est. 1865
Warehouses in All Principal Metal Working Centers

Two Plants Revive Pennsylvania Town

Scottdale, Pa.

• • • **This town which in 1933** was "flat on its back" owing to the shutdown of sheet mills and later the removal of a pipe plant, is now practically back to normalcy owing to the immigration to Scottdale of two manufacturing plants in the past several years. The Duraloy Co., makers of acid and heat resistant alloys, is working at capacity and employment there has done much to remove the stigma of a "ghost" town from Scottdale.

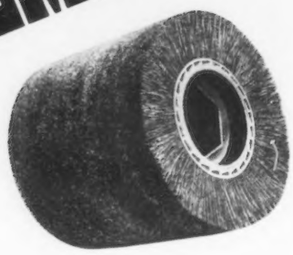
Recently the Uptegraph Co. moved its transformer plant from Pittsburgh to this location and is operating at practical capacity. The increase in coal mining and coke manufacture is also partly responsible for local economic conditions but because of the establishment of the two manufacturing firms here permanently, a better long range outlook is presented, according to local business people.

SOMEWHERE IN GREENLAND: tanker are shown tied up amid the first U. S. forces landed to protect use of U. S. ships emphasize the and increased shipyard activity.

Package Machinery Co. Output 2½ Times Normal on War Work

Springfield, Mass.

• • • **The Package Machinery Co.,** which has turned over its entire manufacturing facilities to production of machines for small arms ammunition, operated at a rate two and a half times normal output for the month of June, Roger L. Putnam, president, reported. Operation is on two shifts, with many of the employees working 66 hr. a week. Last year the company worked with the machine tool industry, and later it made airplane parts.



SECTION ASSEMBLIES for Cleaning and Polishing

Designed especially for Strip Cleaning on brushing machines in steel mills.

Speed Production— Cut Finishing Costs

● "Pittsburgh" Sectional Assemblies may be had in various fill—tampico, fine wire and mixtures.

The sectional segments may be butted together to give the required brush face where sheets and strips of varying widths are processed. This means faster and better finishing. It insures economy, too; as the arbor hole assembly is of inexpensive construction and may be discarded when the brush is worn out.

Consult with our engineering representatives regarding your finishing problems, or write direct for prices on Sectional Assemblies and Refillable Spiral Wound Brushes.

PITTSBURGH PLATE GLASS COMPANY
Brush Division · Baltimore, Md.

Photo by International

Navy patrol boats and a Navy oil ice cakes at the American base by the that land and the United States. Such need for greater steel plate production

Bridgeport Brass Indiana Plant Under Construction

• • • **Construction has started here on** the $11,000,000 brass rolling mill and fabricating plant to be operated by the Bridgeport Brass Co. The 2500 workers who will be employed will be drawn mostly from local labor and will have to be trained in making brass cartridge and cartridge cases.

OPM Opens Seattle, Kansas City, Los Angeles Offices

• • • **New field offices in** Los Angeles, Seattle and Kansas City are to be opened by the Priorities Division, Office of Production Management, it was announced last week by E. R. Stettinius, director. E. C. Laird, Jr., and L. Edward Scriven, assistant deputy directors of the priorities field service, will direct.

Government Picks Sites for Two Midwest Ordnance Plants

New Brighton, Minn.

• • • **A 2400-acre site near** Minneapolis has been taken by the government for construction of the $30,000,000 small arms plant which was reported under consideration a month ago by THE IRON AGE. The plant will be operated by the Federal Cartridge Corp. of Minneapolis under an authorization of $86,000,000 covering construction, equipment and operation. When completed, about 2900 workers, half of them women, will be employed in making ammunition.

↓ ↓

Marion, Ill.

• • • **This district is the site** for the new Illinois ordnance plant to be constructed at a cost of $40,000,000. The project is hailed as as a solution to unemployment in Williamson County which has the largest per capita relief role in the state. About 6500 will be employed here.

This graph shows the comparison between the performance of High-Cycle and universal types of tools. Note that the free speed of High-Cycle tools is much higher and that the speed drops only about 5% under load. Result: faster production.

Wanted: Better tool performance. This manufacturer of automatic scales wanted *faster production* from the same floor space, and they wanted to eliminate the maintenance troubles of their universal electric tools. Air supply wasn't available.

First. I checked the speeds of their tools. Found them operating at only 3000 R. P. M. and even less under load. Brought in my portable frequency changer and demonstrated a High-Cycle tool at 5600 R. P. M. Showed them how speed dropped only 5% under load. (See the accompanying graph.) Its simple design—no brushes, commutator, etc.—also appealed to them.

Results. They bought 13 Rotor High-Cycle Tools—sanders, grinders and die grinders. Installed a compact 10 k.w. converter set in the basement—out of the way. It gave them reserve electric power for at least 5 more tools. Now they do all jobs smoother—*in half the time.* Sanding discs last longer, too.

A compressor for Air tools would have cost $2492; whereas the m.g. set for High-Cycle cost only $770. *Savings due to doubled output will pay for their investment in short order.*

Want High-Cycle FACTS? When should *High-Cycle* be used? When should *Air* be used? The easy-to-understand High-Cycle FACTS Book tells all. Why not write for your free copy? Call me in on your portable tool problems and get a sound unbiased recommendation.

THE ROTOR ANALYST

The Rotor Analyst has 65 different Air tools and 59 different High-Cycle tools with which to solve your grinding, sanding, drilling, etc. problems.

THE ROTOR TOOL CO.
CLEVELAND, OHIO
UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

Free their hands

to produce...

NOT JUST TO LIFT

Hands should be free for live production, not shackled by lifting dead weight. Wherever a portable electric "*BUDGIT*" HOIST can be properly used to do the lifting, then production increases and PROFITS too.

"*BUDGIT*" Hoists rid men's minds and bodies of the fear of strain and rupture. They SAVE ENERGY. *All* the workers' strength then goes into production.

"*BUDGITS*" pay for themselves. This has been proved in thousands of installations in hundreds of industries.

"*BUDGIT*" HOISTS may be hung up, plugged into any electric socket and they immediately start EARNING MORE than their cost.

Write us now for full details about "Budgit" Hoists from $119.00 up with lifting capacities of 250, 500, 1000, and 2000 lbs.

Send for catalog containing complete information, also, "Time Saving Calculator" that shows savings they earn.

"*BUDGIT*" HOISTS

SHAW-BOX CRANE & HOIST DIVISION
MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Makers of all types and sizes of Electric and Hand Operated Cranes and Electric Hoists. Send all your crane and hoist inquiries to Shaw-Box!

National Steel Corp. Earns $5,291,430 in Second Quarter

• • • **National Steel Corp.**, Pittsburgh, reports net profits for the second quarter of 1941 of $5,291,430, compared with $3,004,624 in the corresponding period of last year and $5,430,389 in the first quarter of this year. These figures do not allow for possible increased taxes.

• • • **Pittsburgh Coke & Iron Co.**, Pittsburgh, reports consolidated net profits for the second quarter of 1941 of $227,690, after provision for estimated increased taxes. This compares with earnings of $217,430 for the first quarter of the year, and of $143,029 for the second quarter of 1940. Net sales for the quarter amounted to $4,107,626, and for the first six months $7,772,069.

• • • **Superior Steel Corp.**, Pittsburgh, reports for the second quarter of 1941 net income of $243,689, including deduction for estimated increased taxes. Income for the first quarter of 1941 was $228,364, and for the second quarter of 1940 the figure was $31,661. For the second quarter of this year, net sales were $3,374,208, and for the first six months, $6,624,474.

• • • **United Engineering & Foundry Co.**, Pittsburgh, for the first six months of 1941 reports net earnings of $1,815,290, compared to $1,638,615 for the corresponding period in 1940. The 1941 figure omits provision for estimated increased taxes, which company officials say may reduce earnings from $2.18 per share, arrived at with the present figure, to 40c. per share.

Rock Island Arsenal Gets Browning Machine Gun Plant

Rock Island, Ill.

• • • **Building of 0.30 cal. Browning** machine guns will be undertaken by the arsenal here sometime next spring in a new $3,500,000 plant. Heretofore, the arsenal has rebuilt machine guns but never constructed new ones.

Photo by Harris & Ewing

BATT'S THE NAME: This is a new informal picture of William L. Batt, deputy director of production, Office of Production Management.

Standards Bureau Booklet Describes "U.S.S. Panelbilt"

Washington

• • • **The structural** and heat-transfer properties of "U. S. S. Panelbilt"—prefabricated, sheet-steel constructions submitted by the Tennessee Coal, Iron & Railroad Co., Birmingham—are described in a booklet on building materials and structures just issued by the National Bureau of Standards.

Identified as "Report BMS74," the published results are part of a series issued by the bureau on constructions intended for low-cost houses and apartments. Samples submitted by the company included a wall construction, consisting of a frame and outside face of insulating board; a partition of sheet-steel frame with fiber insulating board on both faces; and roof construction of sheet-steel frame with sheet-steel covering.

These components are joined by bolts and designed for erection on masonry foundations or steel piers.

production insurance

In assembly and service, Laminum shims offer a permanent adjustment feature. Guard against lengthy maintenance interruptions to production machine use. The shim adjustment in eccentric strap on bull gear of this eccentric press provides such insurance. LAMINUM everywhere means quick accurate adjustment continuously for bearing assemblies, sliding fits, gear clusters. . . . Simply *peel* off the .002 or .003 in. thick laminations. • *Shims cut to your specifications. Stock shim materials for repair and maintenance work, obtainable from mill supply dealers.*

Laminated Shim Company
INCORPORATED
76 Union St., Glenbrook, Conn.

Write for file-folder of shim application photos—and Laminum sample.

1667

LAMINUM
THE SOLID SHIM THAT peels FOR ADJUSTMENT

Trade Notes . . .

The Western Foundry Co., Chicago, has reopened its foundry at Holland, Mich. It will be operated by Frank J. Biener, plant manager, and William Selgrath, superintendent.

•

The Hele-Shaw Pump Division, American Engineering Co., Philadelphia, announces the appointment of R. S. Ernst to represent it in Indiana, Wisconsin and part of Illinois. Mr. Ernst is located at 844 Rush Street, Chicago.

•

SKF Industries, Inc., announces that its new Los Angeles, Cal., office and warehouse is located at 1419 South Flower Street, that city.

•

Tube Reducing Corp. announces the transfer of the offices of its manufacturing division from Newark to 520 Main Avenue, Wallington, N. J. Its new postal address is Box 327, Passaic, N. J.

•

Paul Kulka of Kulka Iron & Metal Co., Alliance, Ohio, has announced the opening of a new branch office and yard in Youngstown. The Kulka Company has been in business in Alliance for over 25 years where it maintains a large yard in addition to its brokerage business.

•

Perfection Screw Products Co. has moved to a new plant at 2075 North Temple Avenue, Indianapolis.

•

Star Engineering Co. has moved to 317 Halsey Street, Newark, N. J.

•

Induction Heating Corp., formerly of 791 Broadway, New York, has moved into larger quarters at 389 Lafayette Street, New York, because of increased defense production. Part of the increased space will be used by a research laboratory.

•

Park Chemical Co., Detroit, is enlarging its plant capacity for the production of heat treating salts, chemicals, and carburizing compound, by the addition of a building adjacent to the present plant, and two new coking furnaces. The company also announces the following sales representatives. New England States—Ralph Hare, West Hartford; New York—Manufacturers' Supply Co., Syracuse, N. Y.; Canada—G. A. Kittredge, Montreal.

•

Bury Compressor Co., Erie, Pa., makers of compressors and vacuum pumps, has appointed the following representatives: for North Carolina and Virginia, Allan T. Shepherd Co., Richmond; for Georgia, South Carolina and Florida, John A. Dodd Co., Atlanta; for Alabama, R. E. Boggs, Birmingham; for Texas, C. G. Forshey, Houston; for Louisiana and Mississippi, Menge Pump & Machinery Co., New Orleans; for Kansas and western Missouri, W. R. Fithian, Kansas City; for eastern Missouri and southern Illinois, Lane Machinery Co., St. Louis.

•

Metal Parts Machine Co., Detroit, has moved its factory from 1230 Wilbor Avenue, to 1742 Rivard Street.

•

Berlenbach Foundry Co., Quakertown, Pa., its plant damaged by fire on April 1, has acquired six acres of land at Shelly, Pa., three miles north of Quakertown. Buildings on the property will be remodeled and new buildings will be built for occupance by Sept. 1.

KEEP RACKS ON THE JOB!

UNICHROME* "AIR DRY" RACK COATING

As good as new after hundreds of plating cycles!

Right now, when platers and equipment are under pressure to produce to the limit of capacity—Unichrome "Air Dry" Rack Coating has proved the solution to one vital problem—too frequent recoating of racks.

Because this new material has an unequalled *combination* of advantages, racks coated with it stand up longer, even in severe plating cycles — are unaffected by alkaline cleaners, acid dips, and plating solutions. And out-of-service time is cut to a minimum because of the speed and ease with which Unichrome "Air Dry" Rack Coatings are applied. Racks are dipped in the shipping container — the material dries at room temperature.

Here are the seven big time- and money-saving advantages at a glance:

INSOLUBLE—withstands hot cleaners and all plating solutions
SAFE—contains no ingredients harmful to plating solutions
TOUGH—withstands wear and tear of handling
FLEXIBLE—withstands repeated flexing and bending
DURABLE—reduces the need for recoating
CONVENIENT—any part can be patched without recoating the entire rack
EASILY APPLIED—dipping is done in the container in which it is shipped—the material dries at room temperature.

Address requests for further information or a trial order to the nearest office below.

UNITED CHROMIUM
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51 East 42nd Street, New York, N.Y.
2751 E. Jefferson Ave., Detroit, Mich.
Waterbury, Conn.

*Trade Mark
Reg. U.S. Pat. Off.

J. & L. to Air Condition All Blast Furnaces

Pittsburgh

• • • **With one of its Aliquippa** blast furnaces and two of its Eliza works stacks already equipped with air conditioning units, the Jones & Laughlin Steel Corp. is expected ultimately to service approximately all of its 11 furnaces with this equipment. It is understood that pig iron yield on a tonnage basis has been increased as much as 8 per cent at the Aliquippa works stack and an improvement in quality has also been noted. The two Eliza works stacks are air conditioned by one large unit which began operation several weeks ago. While no definite figures are available as yet, this carrier unit is said to be resulting in a greater than normal yield in production.

Jones & Laughlin expects, by the installation of air conditioning equipment on their existing 11 furnaces, to produce additional tonnage equivalent to that of a new blast furnace. The cost of these air conditioning units is said to be less than 1/3 of the cost of a new stack, and some of the units have been installed in as short a time as 60 days. The type of equipment Jones & Laughlin is installing produces 2.95 grains of moisture per cubic foot of air. Other companies are expected to experiment with equipment producing ¾ grains of moisture and it is understood Carnegie-Illinois has one unit of such equipment on order for its Gary works.

• • • **Oatis-Booth Machinery** Co., with H. R. Oatis, P. E. Booth, L. S. Davies and J. P. Stapleton as firm members, has been organized with offices at 325 Richardson Building, Toledo, Ohio, and at 434 Merchants Bank Building, Indianapolis, Ind.

---

pierces and rivets

AUTOMATIC FEED
"RIVET-PIERCE"
RIVITOR
(the new "RK" machine)

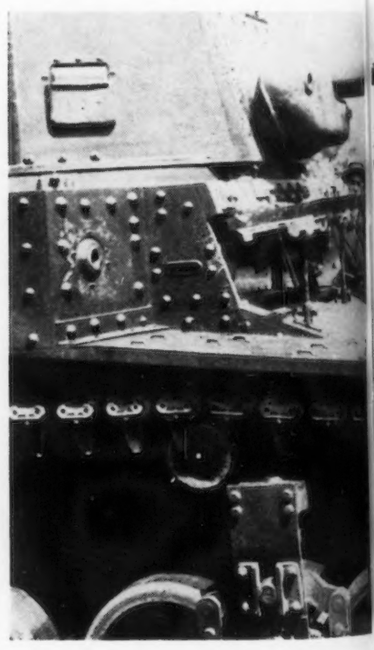
The previously unpierced work is driven down over the underfed rivet—punching a slug out of the work. The rivet is then set at the next stroke of the machine.

Handles solid steel rivets (unannealed) of sizes up to .140 dia. x ¼" long. These may be of any flat head type such as "coopers" or "tinners". The size mentioned above can be set in total maximum work thickness of 0.75.

write for particulars to
THE TOMKINS-JOHNSON COMPANY
628 North Mechanic St., Jackson, Michigan

this is a TOMKINS-JOHNSON *product*

CHURCHILL AND AN M-3: The British Prime Minister Winston Churchill M-3 tanks made in the U. S. to the Lease-Lend bill.



"Jaloppy" Prices Advance As Wreckers Plan Drive

Cleveland

• • • **Campaigns to persuade** "jaloppy" owners to junk their old cars and thus assist the defense drive for more iron and steel scrap are getting under way in several Ohio areas. At the same time prices being paid by wreckers show a slight upward trend. Following newspaper reports of the meetings which OPM and OPACS held recently in Columbus to enlist the assistance of auto wreckers (IRON AGE, July 31, page 89), as well as reports that the steel industry is facing a serious scrap shortage, wreckers encountered an up-surge of inquiries from car owners desirous of having their antique motor cars wrecked.

As high as $29 to $30 was paid here last week for 1928 models, some of which contained up to 140 lb. of aluminum in the crank cases besides 12 or 13 lb. in the heads. Even old batteries are commanding double their previous price on account of the lead they contain.

At Toledo the wreckers quickly banded together and inaugurated "Junk Car Month" for the month of August. Other campaigns were being planned in Cleveland and in the Youngstown area. OPM plans to mail letters to all Ohio auto wreckers Sept. 1, asking them to submit sworn summaries of how much scrap metal has been sent to mills and how many old cars are on hand.

$40 Million Powder Plant For Indiana or Oklahoma

Terre Haute, Ind.

• • • **St. Bernice, Ind., may be** the site of a $40,000,000 smokeless powder plant, reports from Washington indicate. A site near Choteau, Okla., is also being considered.

: The light-suited man in the center is
inston Churchill inspecting one of the first
S. to arrive in England under the terms of

Photo by International

Momentously Important!

So called little things, such as a second of time, an ounce of metal, an unnecessary motion of the hand, have become momentously important in production for *National Defense*. Waste must be reduced to an absolute minimum. T & W forgings, formed to close tolerances, and of unusually sound physical structure, reduce the loss of materials, and aid both skilled mechanics and machine tools to accomplish the utmost production regardless of types, sizes and weights of forgings. A T & W forging engineer can identify for you some of the differences in forgings that have become so momentously important. » »

T W FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY

TRANSUE & WILLIAMS STEEL FORGING CORPORATION
ALLIANCE, OHIO

Sales Offices: New York, Philadelphia, Chicago, Indianapolis, Detroit and Cleveland

S. A. E.

ALLOY STEELS

HY-TEN

Send for Data Sheets

Write for data sheets giving compositions, physical properties, heat-treating guide and applications of our complete line. Keep them handy for reference and be prepared when you need steel in a hurry. Our seven convenient warehouses assure prompt deliveries.

Complete Stocks at
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NEWARK
DETROIT
CHICAGO
CLEVELAND
CAMBRIDGE
CINCINNATI

Wheelock, Lovejoy & Co., Inc.
Main Offices: 126 Sidney St., Cambridge, Mass.

THE ★ MARSCHKE ★ LINE

Speed Up Production—Take the Grinder to the Work!

Rugged MARSCHKE Swing Frame Grinders, from 3 to 15 HP., today are proving their pedigree. Competent operators rely on them for more production. Officials expect less wheel and machine expense than with others.

EIGHTEEN SIGNIFICANT POINTS account for Marschke's *extra* operating economy, *extra* safety, *extra* ease of operation and *extra* long life; repay investigation by the astute grinder buyer. Ask about a Marschke for your rough grinding operations. Write to

Write for Catalog of standard pedestal, floor stand and swing frame Marschke Grinders and Buffers, 1 to 25 HP., 10" to 30" wheels.

VONNEGUT MOULDER CORP.
1843 Madison Ave.
Indianapolis, Ind.

Simplified Marschke for fast, light or medium grinding or buffing.

On the Assembly Line

(CONCLUDED FROM PAGE 64)

suggestion) has recast its tooling program to a scale that will be less time-consuming and less expensive.

Even in the Chrysler and Ford programs there appear to be days when more progress is made backwards than forwards.

ENGINEERS and executives close to these aviation projects sometimes get disheartened enough about the whole thing so they cry on one another's shoulders. Their thinking and actions are geared to yearly model changes in which not a minute is lost in any day's scheduled activities. One of the companies named above has a crew of engineers and draftsmen in a California plant (most of the automobile companies have long since found it necessary to have such crews work with aviation companies because the two industries are miles apart in engineering technique) and the automotive technicians spend their time scratching for information, checking blueprints against actual shop practice and getting the information to bring all the drawings up-to-date. Only page by page are up-to-date drawings reaching Detroit, with releases, so work can be started.

It is hard to record the above in the vein in which it is actually heard here. In print it looks like a simple case of "griping" but it isn't fair to understand it that way. The automotive engineers have been in close enough contact with the airplane engineering departments so they are sympathetic with the problems and complications that aviation is facing. But they can't forget that if they were back working on automobiles they would be able to show more day-to-day progress. Many of the engineering departments here, having dropped automotive work to take part in the defense program, have laid off men pending the arrival of enough data so they can call them back to drafting boards, laboratories and shops and really "put the heat on" and speed up their airplane tooling programs.

Automobile production is sharply slowed down for the model change over season. Output during the past week was 41,795 compared with 62,147 for the previous week, and 11,635 for the corresponding week of last year, according to Ward's Reports, Inc.

Complete Text of Mandatory Priority

(CONTINUED FROM PAGE 92)

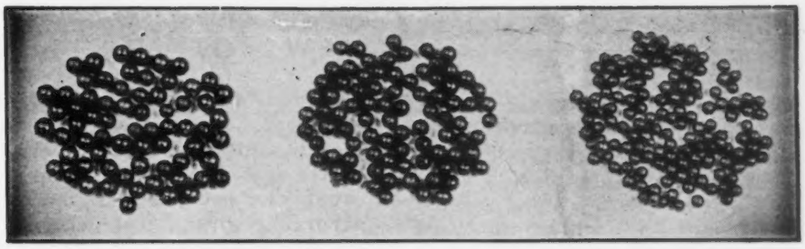
ly from his compliance with the terms of this Order.

(12) **Inventory Restriction.** Unless specifically authorized by the Director of Priorities, no person shall, after the effective date of this Order, knowingly make delivery of steel, and no person shall accept delivery thereof, in an amount, quantity, or number which will increase for any current month the inventory of such steel of the person accepting delivery, in the same or other forms, in excess of the amount, quantity, or number necessary to meet required deliveries of the products of the person accepting delivery, on the basis of his current method and rate of operation.

(13) **Special Instructions.**

(i) Beginning September 1, 1941, no producer of steel shall make, and no person shall accept delivery of steel from a producer unless and until such person shall have filed with the producer at the time of placing his purchase order or contract, a statement on Form PD-73, hereto attached, or in such other form as may from time to time be prescribed by the Division of Priorities, setting forth the purposes for which the material ordered will be used. In the case of orders or contracts placed prior to September 1, 1941, such statement shall be filed before October 15, 1941.

(ii) The Director of Priorities may from time to time issue specific directions to producers requiring them to make deliveries of steel during specified periods in fulfillment of contracts, commitments, or purchase orders for particular purposes or to particular persons. Such directions will be made primarily to insure satisfaction of all defense requirements of the United States, both direct and indirect, and they may be made, in the discretion of the Director of Priorities, without regard to any preference ratings assigned to particular contracts, commitments, or purchase orders. When necessary to assure fulfillment of such directions, the Director may also require any producer to modify or adjust particular production schedules. The Director may also



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We manufacture shot and grit for endurance

A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

The unprecedented demand for our—

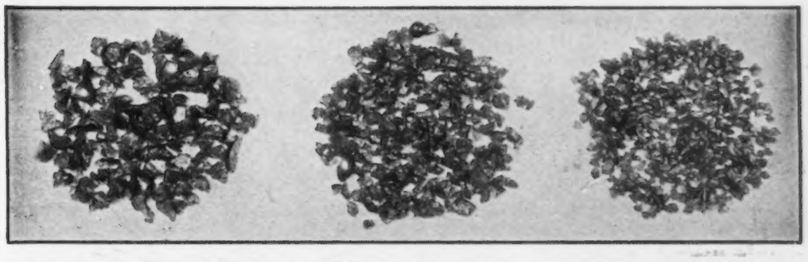
Heat-Treated Steel Shot and Heat-Treated Steel Grit

has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.

HARRISON ABRASIVE CORPORATION

MANCHESTER, NEW HAMPSHIRE

HEAT-TREATED STEEL GRIT



IF GOVERNMENT DEFENSE ORDERS (OR YOUR REGULAR PRODUCTION) REQUIRE UNUSUALLY CLOSE TOLERANCES

Investigate JESSOP "RAPID FINISHING" Tool Steel

Precise dimensions on machined parts call for a tool steel that will hold a keen, hard cutting edge during long runs. Such a steel is Jessop's RAPID FINISHING, which, because of its superior wear resistance, is widely used in forming tools for automatic machine work, precision tools, boring tools, and other tools for fast finishing cuts on aluminum, magnesium alloys, brass, and other metals. Jessop's RAPID FINISHING tool steel characteristically produces the smooth, clean surface so often required in armament production.

RAPID FINISHING is a high carbon-tungsten-chromium steel which costs approximately 40% less than high speed steel. Write today for descriptive Bulletin 541.

JESSOP STEEL CO., 537 Green St., Washington, Pa.

JESSOP STEEL CO. MADE IN AMERICA FINE JESSOP STEELS WASHINGTON, PA.

1901 CELEBRATING OUR 40TH ANNIVERSARY 1941

Jessop Steels of America

CARBON · HIGH SPEED · SPECIAL ALLOY · STAINLESS · and COMPOSITE STEELS

require a person seeking to place a purchase order for steel to place the same with a particular producer.

(iii) For the month of August, 1941, and for each month thereafter, each producer shall make at the time requested by the Director of Priorities, a report in the form to be prescribed by the Director, which shall set forth all records of the orders received and shipments made during such month, and the unfilled orders as of the last day of such month in group and product classifications according to the instructions of the Director, together with such other information as the Director shall from time to time require.

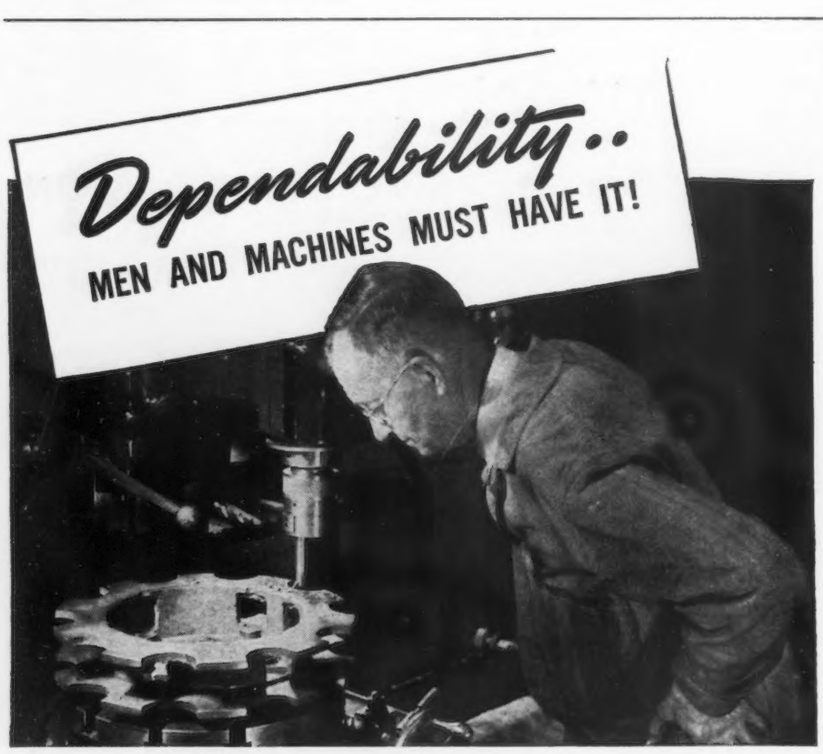
(14) Any allocations made or any preference ratings or other directions issued by the Director of Priorities with respect to the residual supply of steel after the satisfaction of all defense requirements, direct or indirect, shall be in accordance with such Program as the Office of Price Administration and Civilian Supply may determine.

(c) **Records.** All persons affected by this Order shall keep and preserve for a period of not less than two years accurate and complete records of their inventories of steel, and of the details of all transactions in such material. Such records shall include the dates of all contracts, commitments, or purchase orders accepted, the delivery dates specified in such contracts, commitments, or purchase orders, and in any Preference Rating Certificates accompanying them, the dates of actual deliveries thereunder, description of the material covered by such contracts, commitments, or purchase orders, description of deliveries by classes, types, quantities, weights, and values, the parties involved in each transaction, the preference ratings, if any, assigned to deliveries under such contracts, commitments, or purchase orders, details of all Defense Orders either accepted or offered and rejected, and other pertinent information.

(d) **Audit and Inspection.** All records required to be kept by this Order shall, upon request, be submitted to audit and inspection by duly authorized representatives of the Office of Production Management.

(e) **Reports.** All persons affected by this Order shall execute and file with the Office of Production Management such reports and questionnaires as said Office shall from time to time request. No reports or questionnaires are to be filed by any person until forms therefor are prescribed by the Office of Production Management.

(f) **False Statements.** Any person who wilfully falsifies any records which he is required to keep by the terms of this Order or by the Director of Priorities, or who otherwise wilfully furnishes false information to the Director of Priorities or to the Office of Production Management, and any person who obtains a delivery or a preference rating for a delivery by means of a material and wilful



● Wherever Cleereman Drilling Machines and Jig Borers are used, dependability of machines is added to the dependability of operators. This is the combination that lowers costs, and turns out better work in greater quantities.

The materials and workmanship in Cleereman Machines are of highest quality. Cast parts are designed for great rigidity and are made of dense, close-grained metal which is highly resistant to wear and shock. All important castings are normalized before being finished machined. Steel parts subjected to wear are hardened, gears are precision ground, and bearings are of great size to minimize wear.

Let Cleereman dependability aid production in your shop.

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Bryant Machinery & Engineering Company
400 W. Madison St., Chicago, Ill., U. S. A.
Sales Division of
Cleereman Machine Tool Company

CLEEREMAN
DRILLING MACHINES and JIG BORERS

misstatement, may be prohibited by the Director of Priorities from making or obtaining further deliveries of steel. The Director of Priorities may also take any other action deemed appropriate, including the making of a recommendation for prosecution under Section 35 of the Criminal Code (18 U.S.C. 80).

(g) **Appeal.** Any person affected by this Order who considers that compliance herewith would work an exceptional and unreasonable hardship upon him, may appeal to the Division of Priorities by addressing a letter to the Division of Priorities, Office of Production Management, Social Security Building, Washington, D. C., setting forth the pertinent facts and the reasons such person considers that he is entitled to relief. The Director of Priorities may thereupon take such action as he deems appropriate.

(h) **Notification of Customers.** Any person who is prohibited from or restricted in, making deliveries of steel by the provisions of this Order shall, as soon as practicable, notify each of his regular customers of the requirements of this Order but the failure to give such notice shall not excuse any customer from the obligation of complying with the terms of this Order.

(i) **Revocation of General Steel Preference Delivery Order.** General Steel Preference Delivery Order issued May 29, 1941, as amended, is hereby revoked, effective as of the effective date of this Order.

(j) **Effective Dates.** This Order shall take effect on the 9th day of August, 1941, and, unless sooner terminated by direction of the Director of Priorities, shall expire on the 30th day of November, 1941. (OPM Reg. 3, Mar. 7, 1941, 6 F.R. 1596; E.O. 8629, Jan. 7, 1941, 6 F.R. 191; sec 2(a), Public No. 671, 76th Congress, sec. 9, Public No. 783, 76th Congress.)

(Signed) E. R. Stettinius, Jr.,
Director of Priorities

Order for Sea-Going Trucks

• • • **Six amphibian motor** vehicles will be purchased by the War Department for testing their tactical ability. The new sea-going trucks will speed 55 miles an hour on land, five miles an hour on water. The name of the manufacturer was not disclosed.

Alabama Sets Up Priorities Committee

Birmingham

• • • **A six-man priorities** committee has been appointed by Associated Industries of Alabama to study and suggest methods of meeting problems for Alabama industry resulting from the application of priorities.

The committee is composed of James P. Barnes, Alabama Asphaltic Limestone Co., chairman; C. F. Allison, American Smelting & Refining Co.; W. M. Given, Young & Vann Supply Co.; Kent Knight, Stockham Pipe Fittings Co.; R. W. Nueller, Tennessee Coal, Iron & Railroad Co., and Edward Hirs, Waterman Steamship Corp.

WYANDOTTE

★ Metal Cleaners

★ Service

TEAM UP FOR DEFENSE!

Wyandotte Products are being used for the following problems:

1. Electrolytic or spray cleaning of *aluminum alloy castings* on high-speed production basis after machining and prior to *anodizing.*

2. Electrolytic cleaning of *steel* after machining prior to *hard chrome* and *cadmium.*

3. Power washer cleaning of *airplane motors* prior to and after assembling.

4. Tank cleaning of *brass shell cases* during the numerous operations of *drawing, tapering* and *annealing.*

5. Power washer cleaning of *machine gun parts* prior to finishing.

6. Power washer cleaning of *steel shells.*

7. Power washer cleaning of *screw - machine aluminum and brass munition parts.*

8. Power washer cleaning *manganese steel helmets* prior to painting.

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THE J. B. FORD SALES COMPANY

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Wyandotte PRODUCTS

SERVICE REPRESENTATIVES IN 88 CITIES

THE J. B. FORD SALES COMPANY, WYANDOTTE, MICHIGAN

SIGNS

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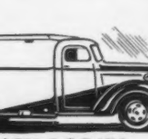
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THEATRE MARQUEES

Superior Galvannealed
PATENTED PROCESS
TRADE MARK

A Quality Sheet
FOR QUALITY JOBS

The mark of SUPERIOR GALVANNEALED means the most highly developed zinc-coated steel sheet. It is heat treated to give three advantages—(1) Excellent workability, (2) Rust resistance and (3) A superior painting surface. All three are essential to the highest quality in many products.

THE SUPERIOR SHEET STEEL CO., CANTON, OHIO
(Division of Continental Steel Corp.)

CONTINENTAL SUPERIOR STEEL
SUPERIOR
CONTINENTAL STEEL CORPORATION

HERE LIES A GOOD TOOL THAT WAS SADLY ABUSED

SAVE YOUR TOOLS
from an early death

Save the tools from abuse and you save on production costs. After you have done a good job in tooling your machine tools, finish the good work with a good coolant pump. It will save your tools from an early grave.

Many builders and users of machine tools prefer the Gusher Coolant Pump with its variable delivery from a trickle to a flood. They like the packless, non-priming, non-clogging features of the Gusher Pump.

The RUTHMAN Machinery Company
1821 READING ROAD, CINCINNATI, OHIO, U.S.A.

Government Awards

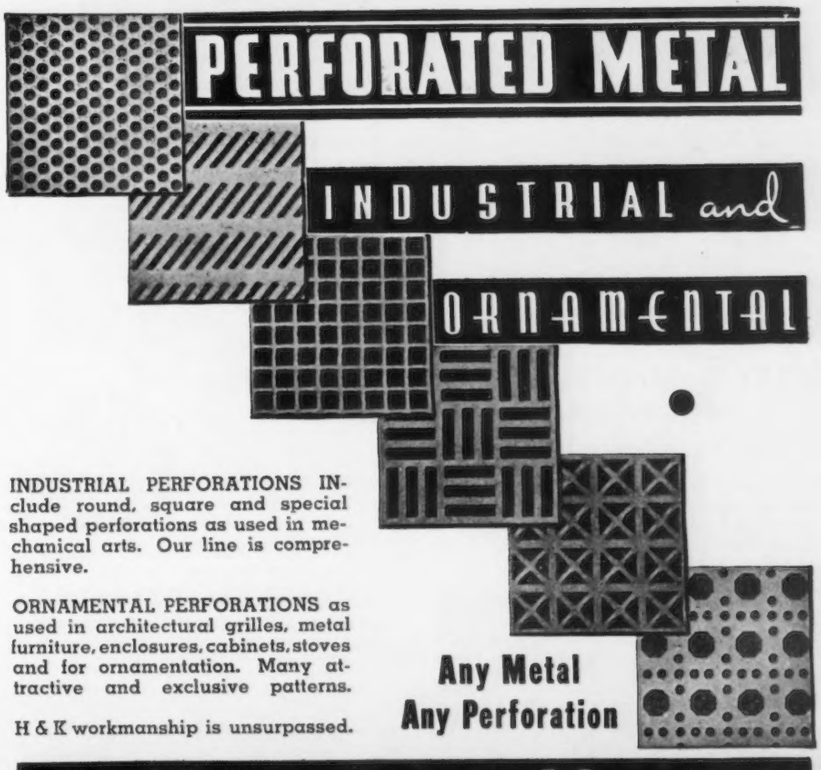
War Dept., Ordnance:

Robert Abel, Inc., Boston; pouring car and hoists for casting machines $10,435
electric hoists 6,072
Ace Drill Co., Detroit; drills..... 1,959
Accurate Tool Co., Newark; tools 3,112
Adirondack Foundries & Steel Co., Inc., Watervliet, N. Y.; steel castings 2,995
Advance Stamping Co., Detroit; assemblies, primer detonator .. 1,495
Allegheny Forging Co., Pittsburgh; forgings 3,045
Allegheny Ludlum Steel Corp., Watervliet, N. Y.; steel 91,960
Alton Iron Works, Inc., New York; steel, carbon 1,245
Alvey Conveyor Mfg. Co., St. Louis conveyor section and gravity rollers 1,142
American Broach & Machine Co., Ann Arbor, Mich.; machines .. 63,760
American Car & Foundry Co., New York; seats for tanks 9,107
parts for bombs 467,500
parts for tanks 226,356
American Cutter & Engineering Co., Detroit; plungers 1,080
American Gas Furnace Co., Elizabeth, N. J.; nichrome retorts .. 1,140
American Locomotive Co., Latrobe, Pa.; springs 3,942
forgings 18,656
American Steel & Wire Co., Cleveland; steel, chrome molybdenum 6,747
Armstrong and Son, New York; sledges, blacksmith's 1,330
Armstrong-Blum Mfg. Co., Chicago; machine, hack sawing ... 4,639
Atlantic Screw Works, Inc., Hartford; screws 2,556
Auto Specialties Mfg. Co., St. Joseph, Mich.; shell 595,000
Automatic Machine Products Co., Attleboro, Mass.; primers, percussion 621,756
Axelson Mfg. Co., Los Angeles; lathe, motor 6,671
Baldwin Locomotive Works, Standard Steel Works Division, Philadelphia; castings, steel 372,708
Barber-Colman Co., Rockford, Ill.; cutters 4,178
Barker Tool Die & Gauge Co., Detroit; gages 5,966
Barlow & Seelig Co., Ripon, Wis.; shells 339,765
Bendix Aviation Corp., Eclipse Aviation Division, Bendix, N. J.; cranks, starting 11,340
parts for tanks 24,839
Blood Brothers Machine Co. Division of Standard Steel Spring Co., Allegan, Mich.; joints, flexible 2,261
Bohn Aluminum & Brass Corp., Detroit; castings 44,230
Boonton Machine Shop, Boonton, N. J.; rollers, adapter, funnels, pins, clamps, washers, etc. 5,895
tools 1,755
Borg-Warner Corp., Rockford Drilling Machine Division, Rockford, Ill.; assemblies for trucks 13,496
Bridge Tool & Die Works, Philadelphia; ejecting stems and dies.. 1,500
Bridgeport Brass Co., Bridgeport, Conn.; discs, cartridge brass ... 758,827
Briggs & Stratton Corp., Milwaukee; fuzes 49,987
Brown & Sharpe Mfg. Co., Providence; blades, turning 2,304
Bryant Chucking Grinder Co., Springfield, Vt.; grinder, hole.. 5,395
Budd Wheel Co., Detroit; discs for use with truck tires 4,648
Buffalo Fire Appliance Corp., Buffalo; truck, fire 3,595
Burgess Co., Inc., Beaver Falls, Pa.; shot 910,000
Cambridge Screw Co., Cambridge, Mass.; primers, percussion 270,987
Carborundum Co., Chicago; grind-

Awards . . .

ing wheels, polishing grain and dressing sticks 1,897
G. O. Carlson, Inc., Thorndale, Pa.; steel 8,795
Carnegie-Illinois Steel Corp., Chicago; steel 13,267
Chicago Steel Foundry Co., Chicago; castings 3,321
C. B. Christiansen, Newark; fixtures, extra bushings, plates and blocks 2,250
pins, firing 12,800
Cincinnati Ball Crank Co., Cincinnati; casings, burster 62,293
shell casings 31,755
Circle Wire & Cable Corp., Maspeth, N. Y.; cable, lead 3,430
Cleveland Twist Drill Co., Cleveland; reamers 1,167
Colonial Broach Co., Detroit; machines, sharpening 21,210
fixtures 1,785
Compress Buckle Co., Attalla, Ala.; shells 920,000
Continental Motors Corp., Detroit; assemblies, manifold and exhaust 2,240
Cowles Tool Co., Cleveland; reamers and counterbores 1,320
Crescent Insulated Wire & Cable Co., Trenton, N. J.; steel 1,460
Crosby Company, Buffalo; magazines 420,000
Cross Gear & Machine Co., Detroit; machine, chambering ... 7,148
Crucible Steel Casting Co., Milwaukee; castings 2,265
Crucible Steel Co. of Amercia, Harrison, N. J.; forgings, tube, alloy steel 8,645
steel 5,767
steel, nickel chromium 6,390
Cummins Engine Co., Columbus, Ind.; engine for tanks 3,901
Dalzen Tool & Mfg. Co., Detroit; cutting tools 3,402
Derbyshire Machine & Tool Co., Philadelphia; holders, punch ... 1,920
dies 4,095
A. P. de Sanno & Son, Phoenixville, Pa.; wheels, grinding 1,651
Henry Disston & Sons, Inc., Philadelphia; rings for presses 3,148
Donaldson Co., Inc., St. Paul; air cleaner assemblies for tanks ... 1,398
R. D. Eaglesfield, Indianapolis; shell 80,000
Eclipse Counterbore Co., Chicago; tools 1,203
Charles F. Elmes Engineering Works, Chicago; press, hydraulic straightening 3,600
Engineering and Research Corp., Riverdale, Md.; machines 36,465
Ex-Cell-O Corp., Detroit; machines 483,025
Fedders Mfg. Co., Buffalo; clips, cartridge 155,244
Federal Screw Works, Detroit; automatic rifle parts 1,388
S. A. Felton & Son Co., Manchester, N. H.; wire brushes 6,615
A. Finkl & Sons Co., Chicago; forgings, alloy steel 1,700
Finnell System, Inc., Elkhart, Ind.; machines, electric polishing and scrubbing 1,050
Firth-Sterling Steel Co., McKeesport, Pa.; tools for drill machine 1,845
Framanco Co., Boston; shells 545,670
Franklin Equipment Co., Monticello, Iowa; equipment, towing and accessories 56,396
Russell R. Frey, Glendale, Cal.; milling machines 1,870
Fuller Mfg. Co., Unit Drop Forge Division, West Allis, Wis.; drop forgings 15,977
General Drop Forge Division, Brown-Lipe Gear Co., Buffalo; steel forgings 2,269
General Electric Co., Schenectady; cable 4,324
General Electric Co., Federal & Marine Dept., Schenectady; furnace, gas carburizing 6,177

Speed up SAND BLASTING
Ruemelin Sand Blast Cabinets put blast cleaning operations on a faster, more efficient basis. Simple to operate. No skilled labor needed. Built for long, continuous trouble-free service. Use sand or steel abrasives. Dustless! Hygienic! Write for New Catalog 32-A Just Off the Press.
RUEMELIN MFG. COMPANY
3870 N. Palmer St., Milwaukee, Wis.
RUEMELIN Blast Cleaning Cabinets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ORNAMENTAL
INDUSTRIAL PERFORATIONS include round, square and special shaped perforations as used in mechanical arts. Our line is comprehensive.
ORNAMENTAL PERFORATIONS as used in architectural grilles, metal furniture, enclosures, cabinets, stoves and for ornamentation. Many attractive and exclusive patterns.
H & K workmanship is unsurpassed.
Any Metal
Any Perforation
The Harrington & King PERFORATING CO.
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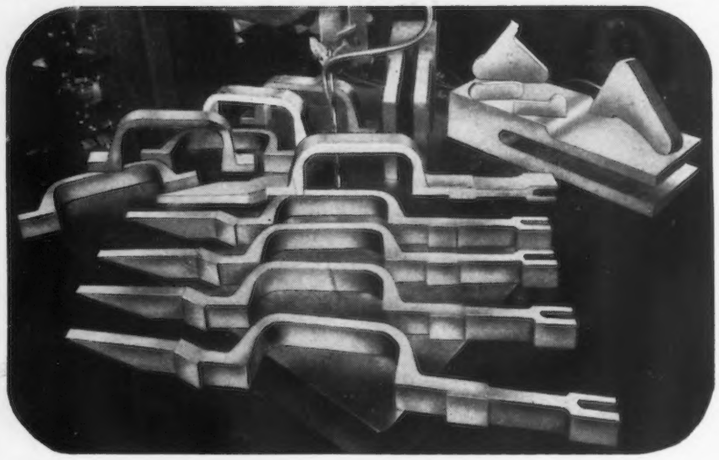
New York Office, 114 Liberty Street

General Motors Corp., Delco Brake Division, Dayton, Ohio; housings for shell 69,320
General Motors Corp., Guide Lamp Division, Anderson, Ind.; cartridge cases 2,450,000
G. M. Gibson, Bellevue, Iowa; parts for tanks 2,437
Gillen Woodwork Corp., Milwaukee; spare parts, chest 8,958
Gillette Safety Razor Co., Boston, Mass.; primers, percussion 47,350
Goepfert & Buck, New York; tacks,; boxes; washers, lock steel 5,666
Grand Rapids Brass Co., Grand Rapids, Mich.; fuze, bomb 54,534
Great Lakes Steel Corp., Ecorse, Detroit; rails 5,731
steel 2,679
Greene-Wolf Co., Inc., Elizabeth, N. J.; chrome nickel steel 2,855
Edward Groh Metal Products Co., Philadelphia; screen, fire stop.. 1,030
Gullett Gin Co., Amite, La.; bombs, practice 37,897
Hamilton Metal Products Co., Hamilton, Ohio; chests, steel .. 1,320
Louis Hanssen's Sons, Davenport, Iowa; nuts and screws 6,803
wrenches 2,970
Hardinge Brothers, Elmira, N. Y.; machines, lathes & milling 15,081
Harrisburg Steel Corp., Harrisburg, Pa.; bombs, demolition, including fin and assembly 1,402,390
Hartford Electric Steel Corp., Roxbury, Mass.; castings, steel 3,722
Herman Machine & Tool Co., Tallmadge, Ohio; pins of steel tubing 14,800
Herschede Hall Clock Co., Cincinnati; housings for shells 45,890
R. Hoe & Co., Inc., New York; equilibrators 15,635
Hudson Canvas Products, Inc., New York; tool rolls 2,132
International Harvester Co., Chicago; forgings 8,306
J. C. H. Automatic Machine Works, Philadelphia; parts for shells 5,280
Johnson-Claflin Corp., Marlboro, Mass.; gages 1,594
Jones & Lamson Machine Co., Springfield, Vt.; machines, grinding and measuring 36,270
steel 10,017
Jones & Laughlin Steel Corp., Pittsburgh; steel 1,306
Kearney & Trecker Corp., Milwaukee; machines, milling 32,379
John P. Kelly, Philadelphia; castings, bronze 51,736
Kennedy-Van Saun Mfg. & Engineering Co., Danville, Pa.; lathes 929,700
Kern Co., New York; machine, automatic lens grinding and polishing 8,500
King-Seeley Corp., Ann Arbor, Mich.; fin assembly 553,932
Kohler Co., Kohler, Wis.; fuzes... 135,000
Krebs Mfg. & Engineering Co., Chicago; gages 1,612
Lamson Corp., Syracuse, N. Y.; gun mounts 320,100
Lamson & Sessions Co., Cleveland; bolts, nuts, pins, and screws ... 2,985
LaSalle Steel Co., Chicago; steel.. 2,791
Lehigh Foundries, Inc., Easton, Pa.; grenade bodies 22,680
Liberty Tool & Die Corp., Rochester, N. Y.; dies 8,430
Liberty Tool & Gage Works, Providence; gages 4,110
Lincoln Park Tool & Gage Co., Lincoln Park, Mich.; gages 3,297
Lindberg Engineering Co., Chicago; furnace, gas fired 2,244
Link-Belt Co., Detroit; drives, chain 1,350
Lodge & Shipley Machine Tool Co., Cincinnati; lathes 10,478
Lux Clock Co., Waterbury, Conn.; shafts, centrifugal 1,376
Lyon Metal Products, Inc., Davenport, Iowa; parts, shelving 1,904
Mantle & Co., New York; machine, milling 2,530
Master Metal Products, Inc., Buffalo; chests, steel 1,464
Mattatuck Mfg. Co., Waterbury, Conn.; screw eyes 1,800

WHITLEY BOMBERS: The plane took part in a British raid on the Westphalia.

DoAll SAVED $600 ON THIS ONE JOB!



Taylor-Wilson Mfg. Co., McKees Rocks, Pa., had an important defense contract calling for forgings for large parts in the foreground. Dies would have cost lots of money. Making them by hand would have been slow and very expensive. The DoAll made the parts in 16 hours and this firm calculates that the saving was $600.

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German city of Munster, capital of

W. L. Maxson Corp., New York; drives for fuze setter	2,300
P. F. McDonald Co., Boston; steel plate carbon	4,730
McKenna Metals Co., Latrobe, Pa.; tools	5,220
Mercury Mfg. Co., Chicago; truck, battery operated	6,621
Micromatic Hone Corp., Detroit; honing tools	10,307
Midvale Co., Philadelphia; armor plates	62,658
forgings	336,761
Milwaukee Saddlery Co., Milwaukee; spare parts cases	6,480
Modern-Bond Corp., Wilmington; blocks, adjustable base	1,815
Moline Mfg. Co., Racine, Wis.; heaters	2,198
Monarch Machine Tool Co., Sidney, Ohio; lathe	12,914
Moore Machinery Co., Berkeley, Cal.; machine tools	18,348
Moore Special Tool Co., Inc., Bridgeport, Conn.; dies	7,750
Morey Machinery Co., Inc., New York; profilers	19,207
Mueller Brass Co., Port Huron, Mich.; forgings, brass	1,705
A. F. Murphy Die and Machine Co., Boston; plate stampings	3,313
National Automatic Tool Co., Richmond, Ind.; machines, drilling	21,140
National Broach & Machine Co., Detroit; tester, gear	1,898
National Forge & Ordnance Co., Irvine, Warren Co., Pa.; forgings, alloy steel tube	131,840
National Twist Drill & Tool Co., Detroit; drills	2,636
National Wire & Cable Co., Pittsburgh; cable and wire	1,967
W. H. Nichols and Sons, Waltham, Mass.; machines, milling	2,574
Niles-Bement-Pond Co., Pratt and Whitney Division, West Hartford; drill shanks and spools	1,480
machine, drilling	16,716
gages	3,740
taps	1,532
Noble & Westbrook Mfg. Co., East Hartford; machine, marking	1,175
Noblitt-Sparks Inc., Greenwood, Ind.; casings, burster, with metal parts	677,396
O'Brien Machinery Co., Philadelphia; machines	6,120
O'Keefe & Merritt Co., Los Angeles; fin assemblies	14,200
Oil Well Supply Co., Oil City, Pa.; shell	243,250
Pangborn Corp., Hagerstown, Md.; grit, steel	1,825
Parent Metal Products, Inc., Cleveland; tables, solder reclaiming and steel locker units	1,403
Peco Mfg. Corp., Philadelphia; plugs, lifting, eyebolt	92,557
Pennsylvania Forge Corp., Philadelphia; forgings	969,629
Pennsylvania Smelting and Refining Co., Philadelphia; lead, antimonial	209,665
Precision Castings Co., Fayetteville, N. Y.; stock, die casting	4,392
Quality Tool & Die Co., Indianapolis; gages	11,262
Reliable Tool Co., Irvington, N. J.; tools	4,116
Republic Steel Corp., Union Drawn Steel Division, Massillon, Ohio; steel bar	123,612
Revere Copper & Brass Co., Inc., Rome, N. Y.; brass discs	54,104

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GOVERNMENT AWARDS

Robertshaw Thermostat Co., Youngwood, Pa.; boosters 895,923
Rolock, Inc., Southport, Conn.; grabs 11,040
Rotary Electric Steel Co., Detroit; chromium molybdenum 13,932
Roy E. Roth Co., Rock Island, Ill.; assemblies, fluid chest and supply closet 41,600
Joseph T. Ryerson & Son, Inc., Chicago; steel 4,988
S. A. F. Steels, Inc., Cleveland; steel 3,906
George Sall Metals Co., Philadelphia; lead, antimonial 142,250
R. F. Sedgley, Inc., Philadelphia; pistols 10,486
Servel, Inc., Evansville, Ind.; cartridge cases 797,297
Shanklin Mfg. Co., Springfield, Ill.; fuzes, percussion 160,020
Sheffield Corp., Dayton, Ohio; machines, gaging 11,800
gages 1,639
Sidney Machine Tool Co., Sidney, Ohio; lathe, engine 8,670
Sieg Co., Davenport, Iowa; parts for tanks 1,384
files 1,804
Sinko Tool & Mfg. Co., Chicago; gages 2,160
Sipp-Eastwood Corp., Paterson, N. J.; fixtures, cutters, screws, adapters and crank shaft brakes 2,966
Smalley-General Co., Bay City, Mich.; machines, thread milling 33,770
H. A. Smith Machinery Co., Syracuse, N. Y.; grinders 16,802
South Bend Lathe Works, South Bend, Ind.; lathes 1,059
Sowers Mfg. Co., Buffalo; kettle, steam jacketed 1,757
Spicer Mfg. Corp., Toledo, Ohio; parts for tanks 2,933
Standard Machinery Co., Providence, R. I.; roller bearings ... 1,270
Standard Pressed Steel Co., Jenkintown, Pa.; hardening steel cores for bullets 4,820
Star Cutter Co., Detroit; tools, cutting 28,899
Stewart-Warner Corp., Chicago; fuze 1,884,923
Struthers-Wells-Titusville Corp., Titusville, Pa.; forgings 596,953
Surface Combustion Corp., Toledo, Ohio; furnaces 8,513
Taft-Peirce Mfg. Co., Woonsocket, R. I.; gages 4,600
Seth Thomas Clocks, Thomaston, Conn.; gears, pinions, timing disc bushings and collars 26,935
Thorrez & Maes Mfg. Co., Jackson, Mich.; plugs, fuzes 3,250
Timken-Detroit Axle Co., Detroit; forgings 66,631
tank parts 30,621
Timken Roller Bearing Co., Canton, Ohio; bearings, roller 1,809
Titan Metal Mfg. Co., Bellefonte, Pa.; bodies, plunger 42,320
Tools & Gages, Inc., Cleveland; gages 3,608
Triad Tool & Die Co., Newark; tools 1,475
Tri-Metal Products Corp., Conshohocken, Pa.; castings, manganese bronze 13,997
Castings, bronze 61,093
Troy Tool & Gage Co., Detroit; gages 3,148
True Alloys, Inc., Detroit; castings, copper-silicon alloy 1,296
Uchtorff Co., Davenport, Iowa; equipment, towing and accessories 18,652
Union Spring & Mfg. Co., New Kensington, Pa.; steel springs and spring washers 1,614
Union Twist Drill Co., Athol, Mass.; cutters, milling 1,162
Keys, woodruff 2,282
Unique Specialties, Inc., New York; tools 1,303
United Drill, Whitman and Barnes Division, Detroit; reamers 1,430
United States Machine Tool Co., Cincinnati; machines, milling .. 4,379
U. S. Metals Refining Co., Carteret, N. J.; lead, antimonial 31,875
solder 1,537
Universal Crusher Co., Cedar Rapids, Iowa; assemblies, cradle .. 54,826
Universal Cyclops Steel Corp., Worcester; steel bar 1,554
Utility Screw Co., Inc., New York; pins, misc. cotter 1,162
Vanadium-Alloy Steel Co., Latrobe, Pa.; steel 5,866
Van Norman Machine Tool Co., Springfield, Mass.; machines, milling 744,100
Veit and Young, Philadelphia; dies punches and stems 37,303
Vinco Corp., Detroit; gages 3,870
Vortox Mfg. Co., Clarement, Cal.; air cleaner assemblies for tanks 2,601
W. & L. Machine Co., Philadelphia; dies and punches 8,962
Waltham Grinding Wheel Co., Waltham, Mass.; grinding wheels .. 1,472
Ward LaFrance Truck Corp., Elmira Heights, N. Y.; spare parts for trucks 85,363
Warner Electric Brake Mfg. Co., Beloit, Wis.; electric brakes & drums 26,231
Washburn Wire Co., New York; steel 99,322
Watson-Stillman Co., Roselle, N. J.; press, gap type 6,150
Weldon Tool Co., Cleveland; tools 1,600
Westinghouse Air Brake Co., Wilmerding, Pa.; boosters 544,000
Wicaco Machine Corp., Philadelphia; machine and collets 6,478
J. H. Williams & Co., Buffalo; forgings, drop 1,382
John Wood Mfg. Co., Inc., Muskegon, Mich.; springs and misc. parts 43,649
Yale & Towne Mfg. Co., Philadelphia; trolleys, steel 1,172
York Safe & Lock Co., York, Pa.; assemblies, elevating mechanism 6,042
Zaellea Brothers, Philadelphia; joints, expansion 1,890
Zimmerman Steel Co., Bettendorf, Ia.; steel castings 79,005
steel, alloy 1,930

War Dept., Air Corps:

Air Associates, Inc., Bendix, N. J.; electric motors 109,440
Aro Equipment Corp., Bryan, Ohio; propeller hub assemblies 103,425
oil servo units 150,750
Beech Aircraft Corp., Wichita, Kans.; airplanes and spare pa.ts 12,610,125
Bendix Aviation Corp., Bendix Products Division, South Bend, Ind.; wheel and brake assemblies 100,500
maintenance parts 53,579
Boeing Aircraft Co., Seattle; parts for airplanes 212,090
Bonney Forge & Tool Works, Allentown, Pa.; pliers 7,155
Carnegie-Illinois Steel Corp., Cincinnati; steel sheet 73,668
Crescent Tool Co., Jamestown, N. Y.; wrenches 59,287
pliers 47,731
Crosley Corp., Cincinnati; shackle assemblies 729,995
Curtiss-Wright Corp., Airplane Division, Buffalo; parts for airplanes 142,445
oil tanks 69,646
Curtiss-Wright Corp., Curtiss Propeller Division, Clifton, N. J.; propeller blade assemblies 131,266
Cushman Motor Works, Lincoln, Nebr.; scooter, motor, gasoline.. 124,720
DeJur-Amsco Corp., Shelton, Conn.; meters, exposure, photographic.. 24,660
Despatch Oven Co., Minneapolis; electric ovens 16,750
Douglas Aircraft Co., Inc., Santa Monica, Calif.; fire control system 86,800
Great Lakes Steel Corp., Detroit; steel 42,650

Hanson-Whitney Machine Co., Hartford, Conn.; taps, hand, bottoming 52,027
Hevi Duty Electric Co., Milwaukee; electric furnaces 67,750
Kraeuter & Co., Inc., Newark; pliers 2,565
Lake Erie Engineering Corp., Buffalo; hydraulic press 34,380
Lindberg Engineering Co., Chicago; electric furnaces 96,500
Meriam Co., Cleveland; manometers 40,018
Motch & Merryweather Machinery Co., Cleveland; domestic and export packing 165,580
Moto Meter Gauge & Equipment Division, New York; hydraulic pressure gages 45,000
Oneida Ltd., Oneida, N. Y.; bomb shackle assemblies 546,158
Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford; drills 184,390
Pump Engineering Service Corp., Cleveland; pump assemblies 59,060
Reed & Prince Mfg. Co., Worcester, Mass.; screwdrivers 1,410
Republic Aviation Corp., Farmingdale, N. Y.; laminar-flow wing and tests 139,096
Joseph T. Ryerson & Son, Inc., Chicago; steel, chrome nickel .. 77,271
Utica Drop Forge & Tool Corp., Utica, N. Y.; pliers 31,200
Vlchek Tool Co., Cleveland; screwdrivers 25,060
Vultee Aircraft, Inc., Downey, Cal.; airplanes and spare parts.. 14,518,707
Weston Electrical Instrument Corp., Newark; generator and indicator assemblies 60,896
Wright Aeronautical Corp., Paterson, N. J.; tools for aeronautical engines 87,788

War Dept., Quartermaster Corps:

American Steel and Wire Co. of New Jersey, Cyclone Fence Division, Los Angeles; fencing and illumination 37,909
American Steel & Wire Co., Cyclone Fence Division, Seattle; chain link fence 99,985
E. C. Atkins & Co., Indianapolis; components parts for tool sets, horseshoe s' 504
Autocar Company, Ardmore, Pa.; tractor-trucks, 5-6-ton 492,400
J. Bishop & Co. Platinum Works, Malvern, Pa.; sy inge needles .. 10,680
G. S. Blakeslee & Co., Cicero, Ill.; electric dishwasher 1,257
Buglecroft, Inc., Long Island City, N. Y.; trumpets 2,469
Charleston Sheet Metal and Roofing Works, Charleston, S. C.; four steam tables 4,560
Cleveland Dental Mfg. Co., Cleveland; forceps, tooth extracting.. 2,250
Contracting Engineers Co., Los Angeles; sewage disposal and treatment plant and water supply tank 148,000
Diamond T Motor Co., Chicago; tank transporters 10,096,769
trucks 2,060,761
Fargo Motor Co., Detroit; trucks, ½-ton 131,067
Foster Stove Co., Ironton, Ohio; grates 16,800
Four Wheel Drive Auto Co., Clintonville, Wis.; tractors 188,372
General Motors Corp., New York; trucks and parts 2,726,873
General Motors Corp., Chevrolet Division, Flint, Mich.; cars, light sedan 643,075
dump trucks 346,377
Jas. A. Gorsuch, Jr., Jeffersonville, Ind.; grates 8,700
Harley Davidson Motor Co., Milwaukee; motorcycles 591,915
Haven Busch Co., Grand Rapids, Mich.; chain link fence 8,029
Highway Trailer Co., Edgerton, Wis.; semi-trailers 134,088
International Harvester Co., Fort Wayne, Ind.; trucks 1,104,854
Jackes-Evans Mfg. Co., St. Louis; pipe, stove 52,200
Jacobsen Construction Co., Salt Lake City; locomotive repair shop 223,470
Legion Utensils Corp., New York; mess equipment 13,642
Mack Mfg. Co., Long Island City, N. Y.; chassis and cargo bodies 551,672
trucks 532,432
parts for trucks 47,396
McGrew Machine Co., Lincoln, Neb.; component parts for stoves, tent; arrestors, spark.. 17,175
Milcor Steel Co., Milwaukee; hoods, stovepipe 45,975
A. J. Miller, Bradenton, Fla.; semi-trailer 1,282
P. O'B. Montgomery, Dallas; ordnance magazine 50,000
Packard Motor Car Co., Detroit; cars, medium, 5-passenger sedan 19,196
Olson Construction Co., and Dobson and Robinson, Lincoln, Nebr.; chain link fencing 19,000
Pittman Bros. Construction Co., New Orleans; motor repair shops 178,682
H. K. Porter, Inc., Everett, Mass.; cutters, wire 178,750
Rogers Bros. Corp., Albion, Pa.; tank trailers 1,637,195

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William Schollhorn Co., New Haven, Conn.; cutters, wire 178,750
Smith Fence Co., Buffalo; chain link fence 4,597
Standard Foundry & Furnace Co., DeKalb, Ill.; grates 9,000
William W. Stanley Co., Inc., New York; 40,000 each carriers, wire cutter 7,556
Star Headlight & Lantern Co., Inc., Rochester, N. Y.; lanterns, electric 6,500
Superior Construction Co., Seattle; water purification storage and pumping facilities 66,333
Switzerland & Carson-Newton Co., Belleville, N. J.; surgical instruments 1,515
Torsion Balance Co., Jersey City; prescription scale & balance.... 26,403
Tulsa Rig, Reel and Mfg. Co., Tulsa, Okla.; motor repair shops, grease inspection racks, etc..... 610,000
25-ton ice plant, magazines, fencing, etc. 216,145
Watson Automobile Equipment Co., Cincinnati; semi-trailers, 10-ton 14,105
Wheeling Steel Corp., Martins Ferry, Ohio; stoves, tent 181,500
White Hardware Co., Savannah, Ga., fencing 47,231
White Motor Co., Cleveland; trucks, 6-ton 585,000
Wickwire Spencer Steel Co., San Francisco; chain link fence and gages 8,500
Winter-Weiss Co., Denver; trailers 1,096,200
Yellow Truck & Coach Mfg. Co., Pontiac, Mich.; tractor-trucks, 2½-ton 3,905
trucks, cargo body 4,281,987

War Dept., Corps of Engineers:

American Bridge Co., Ambridge, Pa.; machine gun emplacements 83,232
American Steel & Wire Co. of N. J., Washington; wire 22,279
Anaconda Wire & Cable Co., Washington; cable 24,067
wire 49,590
E. C. Atkins and Co., Indianapolis; saws 8,452
Austin-Western Road Machinery Co., Aurora, Ill.; roller, road... 4,537
Automatic Transportation Co. Division Yale & Towne Mfg. Co., Chicago; trucks, electric 10,506
Baker Industrial Truck Division, The Baker-Raulang Co., Cleveland; truck, electric 5,611
Barber-Greene Co., Aurora, Ill.; ditcher 31,073
Barbour Metal Boat Works, Valley Park, Mo.; steel work, launches 40,611
Capitol Steel and Iron Co., Oklahoma City; hangar door assemblies 98,000
Carnegie-Illinois Steel Corp., Washington; landing mat 276,000
Carter Sheet Metal Works, Inc., Omaha, Neb.; tables, mess 7,500
Central Conveyor & Mfg. Co., St. Louis; conveyors, electric, stacking. 3,460
Chicago Bridge & Iron Co., Los Angeles; elevated water tank.. 68,830
Chicago Bridge & Iron Co., Houston; elevated steel water tanks and appurtenant facilities 106,600
Chicago, Rock Island and Pacific Railway Co., Chicago; railroad cars 38,500
Circle Wire & Cable Corp., Maspeth, L. I.; copper wire 73,200

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Commercial Shearing and Stamping Co., Youngstown, Ohio; brackets, outboard motor 15,590
County Supply Co., Plainfield, N. J.; dividers, wing; knives, drawing; mattox, pick 32,224
Crown Iron Works Co., Minneapolis; pontoon bridges 49,410
Post, screw 142,990
reels, wire 39,880
Electric Industrial Equipment & Supply Corp., Baltimore; shades and switches 10,894
Elifeldt Hardware & Machinery Supply Co., Kansas City; Walker-Turner drill presses 5,487
Elwell-Parker Electric Co., Cleveland; trucks, electric 11,180
Fairbanks-Morse & Co., New York; centrifuge, filter, tank, pump, meter and transformer 2,368
S. W. Flamm Supply Co., New York; oil-burning heaters and stovepipe 2,280
Flour City Ornamental Iron Co., Minneapolis; pontoon sets 606,216
General American Transportation Corp., Chicago; railroad cars... 182,858
General Electric Supply Corp., Bridgeport, Conn.; wire copper 127,160
General Steel Products Corp., Long Island City, N. Y.; steel shelving, grating, hand railing and stairs 172,176
Boyd H. Gibbons, Los Angeles; station wagons and pickup trucks 17,727
W. & L. E. Gurley, Troy, N. Y.; rods, level 6,940
Haffner-Thrall Car Co., Chicago; cars, railroad 62,534
Heinemann Electric Co., Trenton, N. J.; switches and fuses 7,090
James Hughes, Inc., New York; tug-boat complete 11,363
Hussman-Ligonier Co., St. Louis; refrigerators 2,340

Photo by British-Combine

st all the workers shown in this picture of a ory women. In England the expression commonplace. The U. S. still is some distance shortage which has taken thousands of ries.

Midway Electric Supply Co., Inc., New York; fuses, sockets and switches 17,819
Mosher Steel Co., Dallas; structural steel 313,655
Geo. F. Muth, Inc., Hoboken, N. J.; field sets—instruments 58,995
National Mfg. Co., Lincoln, Neb.; stand for shot impact hammer. 2,650
Northwestern Motor Co., Eau Claire, Wis.; work cars 3,640
Omaha Steel Works, Omaha, Neb.; stand for shot impact hammer, double arm 8,625
Panhandle and Santa Fe Railway Co., Hurlwood, Texas; construction of portion of spur 30,345
Pittsburgh-Des Moines Steel Co., Dallas; elevated steel water tanks 142,980
Frederick Post Co., Chicago; rods, level 20,160
Thos. Somerville Co., Washington; misc. pipe and fittings 7,113
Sperry Gyroscope Co., Brooklyn; searchlight units 3,464
Standard Pressed Steel Co., Jenkintown, Pa.; parts for work bench 4,534
Stanley Tools Division of The Stanley Works, Newark; rules and swages 3,242
United Steel Fabricators, Inc., Wooster, Ohio; steam tunnel cover plates 4,388
Warren Pipe Co. of Mass., Inc., Boston; cast iron pipe, bell and spigot 4,671
Washington Spring Works, Inc., Washington; pump, bail 16,975
West Bend Equipment Corp., West Bend, Wis.; elevators 2,050
Whitcomb Locomotive Co., Rochelle, Ill.; diesel electric locomotive 24,860
Gar Wood Industries, Inc., Detroit; motor fueling equipment 4,680
Wood Roadmixer Co., North Hollywood, Cal.; roadmixers 51,814

War Dept., Medical:

Becton, Dickinson & Co., Rutherford, N. J.; needles for dental syringe $1,354
Brillo Mfg. Co., Inc., Brooklyn; steel wool 10,050
Clark Tructractor, Jersey City; carloaders and trucktractors ... 6,158
National Mfg. Corp., Plainfield, Conn.; tables, instrument, folding 1,550
Payne Surgical Mfg. Co., Rochelle Park, N. J.; syringe needles .. 3,690
J. Sklar Mfg. Co., Long Island City, N. Y.; mouth gags 4,795
forceps 171,637
Torsion Balance Company, New York; balances, prescription ... 5,400
Williams Brothers Silver Co., New York; forceps 34,025
J. Wiss & Sons Co., Newark; shears, crown 4,080

Defense Plant Building:

General Motors Corp., Buick Motor Division, Flint, Mich.; expansion of facilities for mfg. aeronautical engines and spare parts $10,267,043
General Motors Corp., Fisher Body Division, Detroit; additional machinery and equipment for mfg. aircraft parts and accessories.. 894,001

Illinois Range Co., Chicago; misc. kitchen equipment 23,496
Iowa Mfg. Co., Cedar Rapids, Iowa; crusher and screening plants 43,927
Jeffrey Mfg. Co., Columbus, Ohio; conveyors, electric, portable ... 2,100
John Motors Division, Outboard, Marine & Mfg. Co., Waukegan, Ill.; outboard motors 34,708
Jones & Laughlin Steel Corp., Aliquippa, Pa.; wire 77,482
A. F. Jors Iron Works, Inc., Washington; transportation auxiliaries 33,031
Daniel J. Keating Co., Philadelphia; boiler houses and steam distribution systems 269,000
Keuffel & Esser Co., Hoboken, N. J.; scales and triangles 19,442
Keystone Steel & Wire Co., Peoria, Ill.; wire 31,084
M. Klein & Sons, Chicago; climbers, lineman's 7,478
Kraeter & Co., Inc., Newark; pliers 22,140
LaCrosse Trailer & Equipment Co., LaCrosse, Wis.; trailers 28,624
R. K. LeBlond Machine Tool Co., Cincinnati; lathes 15,392
A. Leschen & Sons Rope Co., St. Louis; wire rope, slings & clips 28,132
R. G. LeTourneau, Inc., Peoria, Ill.; carryalls 39,655
McGrath Welding & Machine Works, Omaha, Nebr.; double squeezer stands 2,712
sheet metal shrinking machines 2,970
lazy arm standards 2,488
Maclane Hardware Co., New York; tools 16,086
Magor Car Corp., New York; shovels 10,500
Maine Steel, Inc., South Portland, Maine; anchors 22,489
Mercury Mfg. Co., Chicago; trucks, towing 8,470

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3. Correct Manufacturing Methods
4. Furnished in both the Round and Flattened Strand constructions, in either Standard or Preformed Type.

• • Results are what count, and the performance record of this wire rope continues to make and hold friends.

There is no guess work when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. If you will tell us how you use wire rope, we shall be glad to suggest the construction and type most suitable for your conditions.

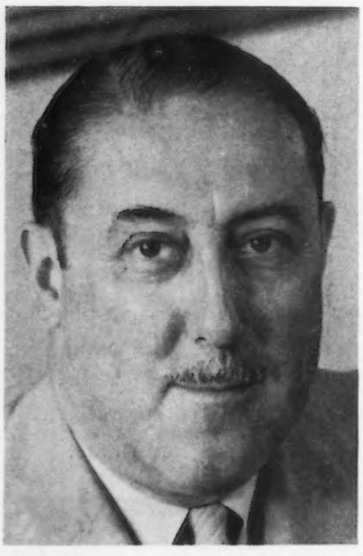
MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
WIRE ROPE MAKERS — ESTABLISHED 1857
5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

NEW YORK • • • 90 West Street
CHICAGO • • 810 W. Washington Blvd.
DENVER • • • 1554 Wazee Street
SAN FRANCISCO • • 320 Fourth Street
PORTLAND • • 914 N. W. 14th Avenue
SEATTLE • • 3410 First Avenue South

PERSONALS

• **Lincoln R. Scafe** has been appointed general manager of the Glenn L. Martin-Nebraska Co. Mr. Scafe, who until recently was general manager of the Fisher division of General Motors Corp. at Cleveland, will take charge of the new plant now being built at Omaha, Neb., for the manufacture of Martin B-26 bombers, dividing his time between temporary offices now established at the Glenn L. Martin Co. of Baltimore, and in Omaha.

• **W. B. Marshall** who has been assistant sales manager of the conveying and engineering products division of the Chain Belt Co., Milwaukee, has been made sales manager of that division. Mr. Marshall, who was graduated from Sheffield Scientific School of Yale University in 1921, has been with the company since 1920. **B. E. Sivyer,** former San Francisco branch manager, has been transferred to Milwaukee as assistant sales manager of the chain belt and transmission division. Replacing Mr. Sivyer as branch manager at San Francisco is **S. Y. Warner** who joined the Chain Belt Co. in 1930 the same year he graduated from the Sheffield Scientific School of Yale University.



LINCOLN R. SCAFE, general manager, Glenn L. Martin-Nebraska Co., Omaha, Neb.

• **Frank R. Burnette** has been appointed assistant chief engineer, Carnegie-Illinois Steel Corp., Pittsburgh. He was first employed at the Farrell, Pa., works of the former Carnegie Steel Co. in 1905 and later entered Ohio Northern University where he was graduated with a degree in civil engineering. Mr. Burnette joined Illinois Steel Co. as inspector of construction at Gary and for the next four years was chief civil engineer for the Southern Aluminum Co. at Whitney, N. C. He joined American Steel & Wire Co. in 1916 and successively became assistant coke works superintendent, superintendent of construction, and assistant chief engineer. He joined Carnegie-Illinois as construction superintendent in 1939.

• **Charles E. McIntyre** has been appointed assistant manager of sales, Carnegie-Illinois Steel Corp., Pittsburgh, at Detroit, Mich., to succeed L. B. Worthington who was recently named manager of sales, bar strip and semi-finished materials division of the company. Mr. McIntyre has been associated with subsidiaries of the United States Steel Corp. during his entire business career. After six years with the warehouse division of the former Carnegie Steel Co. at Cleveland, he entered the Cleveland sales office in 1917, became a salesman in 1924 and assistant manager in 1939. Mr. McIntyre has been in charge of the Buffalo sales office since January, 1940.

• **D. G. Millar** has been elected president of the Greenfield Tap & Die Corp., Greenfield, Mass., to fill the vacancy caused by the resignation of Howard M. Hubbard effective Aug. 31. Mr. Hubbard on Oct. 1 will take over the presidency of the Elliott Co., Jeannette, Pa., manufacturers of turbo-electrical equipment.

• **Arthur P. Emmert,** works manager of the Warner Gear division of the Borg-Warner Corp., Muncie, Ind., has been elected a vice-president of the Warner Gear division.

• **Harry L. Erlicher,** vice-president of the General Electric Co., Schenectady, and in charge of the company's purchasing activities, has been named a member of the Defense Industries Advisory Committee of the Copper and Zinc Industries, a division of the Office of Production Management. Previous to his new appointment, Mr. Erlicher was the industrial user's representative of the Non-Ferrous Metals Priorities Committee of the OPM which was dissolved.

• **J. W. Geddes,** vice-chairman of the Boston chapter of the American Society of Tool Engineers, and mechanical engineer with H. K. Porter, Inc., Everett, Mass., has been appointed advisory consultant to the Office of Production Management in Area No. 2 of the New England States by Sidney Hillman of the OPM.

• **Paul T. Talbott,** ceramic engineer, has joined the research staff of Batelle Memorial Institute, Columbus, Ohio, and has been assigned to the division of ceramic research. A graduate of the University of Illinois, Mr. Talbott was associated with the Cerro de Pasco Copper Corp., Peru, as an experimental engineer before joining the Battelle staff.

• **Edward M. Kimball** has been appointed New England representative for McKenna Metals Co., Latrobe, Pa., with headquarters at New York. Mr. Kimball, who has had a great deal of practical experience in the carbide business, will sell and service Kennametal steel-cutting carbide tools and blanks.

W. B. MARSHALL, sales manager of the conveying and engineering products division of the Chain Belt Co., Milwaukee.

• **N. M. Barnett** has been placed in charge of the new Detroit branch office of the Bailey Meter Co., Cleveland, located in the Curtis Building. Assisting Mr. Barnett are **R. F. Hanson** and **R. T. Cowan.** Additions to the company's field engineering staff include **L. L. Melick** to New York, **J. F. Triolo** to Philadelphia, **G. M. Wallace** to San Francisco, **B. F. Elias** to Cincinnati and **D. E. Smith** to Buffalo.

• **Charles R. Pollock** has been placed in charge of Detroit sales and service of the Mahr Mfg. Co., Minneapolis, with headquarters at 7450 Melville Avenue. **Joseph Sodoma** will handle the New Jersey district with offices at 7 Girard Place, Maplewood, N. J., and **Edward C. Swan** of 2217 East 24th Avenue, Denver, will represent the company in the Colorado, Utah, Oklahoma, Nebraska and Wyoming territory.

• **W. W. Gilbert,** formerly advertising manager of all divisions of the Watson-Stillman Co., Roselle, N. J., has been made general office manager of the fittings division. Fay Keyler, vice-president of O. S. Tyson & Co., Inc., New York, has been put in charge of the company's advertising with offices in Roselle and New York.

• **Sampson O. Miller** has been appointed supervisor of engineering and research of the Electric Cable Works of American Steel & Wire Co., in Worcester, Mass. **Evald O. Whalstrom** succeeds Mr. Miller as transmission engineer and **Robert S. Horner** and **Walter T. Pierce** have been appointed products engineer and consulting electrical engineer respectively.

Mr. Miller has been associated with the company since 1940 as transmission engineer. Mr. Horner started with the company in 1928 as an engineer at South Works, Worcester, and held various positions before becoming an electrical engineer in the Electric Cable Works in July, 1939, which position he has held to the present time. Mr. Wahlstrom became electric cable engineer last November, having started as a draftsman in the tramway department at North Works, Worcester, in 1927. Mr. Pierce became chief operating and development engineer at the Cable Works in Novmber, 1939, having filled various positions since starting as a tester in 1922.

Coming Events

Aug. 25 to 29—National Association of Power Engineers, Baltimore, Md.

Sept. 17 to 19—National Industrial Advertisers Conference, Toronto.

Sept. 18 to 20—Concrete Reinforcing Steel Institute, annual meeting, Colorado Springs.

Sept. 23 to 26—Association of Iron and Steel Engineers, annual exhibition and meeting, Cleveland.

Sept. 25 and 26—Society of Automotive Engineers, National Tractor Meeting, Milwaukee, Wis.

Sept. 25 and 26—Powdered Metallurgy Conference, annual meeting, Cambridge, Mass.

Sept. 29 to Oct. 2—American Mining Congress-Metal Show, San Francisco.

Oct. 1 to 4—Electrochemical Society, Fall Meeting, Chicago.

Oct. 6 to 10—National Safety Congress and Exposition, Chicago.

Oct. 8 to 10—Porcelain Enamel Institute, annual forum, Chicago.

Oct. 14 to 16—American Railway Bridge and Building Ass'n, Chicago.

Oct. 14 to 17—American Institute of Steel Construction, annual convention, New York.

Oct. 16 to 18—American Society of Tool Engineers, semi-annual meeting, Toronto.

Oct. 19 to 24—American Welding Society, annual meeting, Philadelphia.

Oct. 20 to 22—American Gas Association, Atlantic City, N. J.

Oct. 20 to 24—National Metal Congress, Philadelphia.

Oct. 23 and 24—Society of Automotive Engineers, Tulsa, Okla.

• **William Kerber,** Eastern sales manager for the Hanna Furnace Corp., Buffalo, has accepted appointment as an OPM consultant in the pig iron sub-division of iron and steel. He will spend most of his time in Washington, hereafter, seeing that the nation's production of pig iron flows smoothly to defense industries.

• • •

Van Diver to Head N.I.A.A. Study on Material for Ads

• • • **A clinic study** on "How to Get Material" for effective advertising will be conducted by V. H. Van Diver, at the N.I.A.A. Toronto Conference on Sept. 17-19. The clinic will carefully review such items as repair stations, process literature, operating manuals, instruction literature, safety precautions, and "how to make it" directions, as opposed to product descriptions and "where to buy it directions," which have been outmoded by priorities and other effects of national defense.

Mr. Van Diver is manager of the advertising and exhibits division of the Union Carbide Co., New York, and has been engaged in advertising work since 1923.

OBITUARY...

• **M. J. Tennes, Sr.,** chairman of the board of directors of the Shafer Bearing Corp., since 1934, died recently. His son, M. J. Tennes, Jr., is president of the corporation, and two other sons are directors.

• **Frederick E. Poor,** experimental engineer of the Pitney-Bowes Postage Meter Co., Stamford, Conn., since its organization twenty years ago, died at Darien, Conn., Aug. 5. He was born in Boston 60 years ago, and was graduated from the Massachusetts Institute of Technology in 1912. The following year he became affiliated with the Universal Stamping Machine Co., New York, predecessor of Pitney-Bowes.

• **E. Kent Hubbard,** president of the Connecticut Manufacturers' Association since 1918 and former president of the Maxim Silencer Co., Hartford, died Aug. 7 at Middletown, Conn. He was born 72 years ago in Chicago.

• **Charles T. Ramsden,** vice-president of the Beloit Iron Works, Beloit, Wis., with which he was associated for more than 46 years, died Aug. 3 at his home. He was 71 years old.

• **Richmond P. Wetmore,** chief mining engineer for Woodward Iron Co., Birmingham, died Aug. 8 in a Birmingham hospital, aged 46 years. A native of Birmingham, Mr. Wetmore had been associated with Woodward for more than 20 years.

• **Willis G. Austin,** assistant superintendent of the Draper Corp., died in Hopedale, Mass., Aug. 7. He was born in Augusta, Me., 68 years ago and was associated with the Draper Corp. 48 years.

• **George H. Jones,** president and treasurer of the Hillside Fluor Spar Mines, died July 6. Mr. Jones was one of the founders of the Inland Steel Co.

CONSTRUCTION STEEL

. . . STRUCTURAL STEEL, REINFORCING BARS, PLATES, PILING, ETC.

Fabricated Steel

Awards jump to 32,880 tons; new projects decline to 14,865 tons.

AWARDS

NORTH ATLANTIC STATES

5025 **Tons,** Rome, N. Y., government airplane repair building, to Harris Structural Steel Co., Plainfield, N. J.

1760 **Tons,** Buzzard's Point, Washington, D. C., Unit No. 5 for Potomac Electric Power Co., to American Bridge Co., Pittsburgh.

1400 **Tons,** Belleville, N. J., defense plant for Walter Kidde Co., to Lehigh Structural Steel Co., New York.

1100 **Tons,** Hopedale, Mass., Draper Corp. plant to Bethlehem Steel Co., Bethlehem, Pa.

610 **Tons,** Brooklyn, N. Y., manufacturing and storage building for Robins Dry Dock & Repair Co., to Harris Structural Steel Co., Plainfield, N. J.

600 **Tons,** Brooklyn, N. Y., manufacturing and storage building for Todd Shipyards Corp., to Harris Structural Steel Co., Plainfield, N. J.

515 **Tons,** Worcester, Mass., store building for F. W. Woolworth Co., to A. O. Wilson Structural Co., Boston.

500 **Tons,** Allentown, Pa., transmission line towers for Pennsylvania Power & Light Co., to Lehigh Structural Steel Co., New York.

328 **Tons,** Melville, R. I., peg top buoys for Navy Department, to Leach Steel Co., Rochester, N. Y.

325 **Tons,** Philadelphia, crane bridges for U. S. Navy, to American Bridge Co., Pittsburgh.

300 **Tons,** New Bedford, Mass., Fort Rodman, casement steel, to Bethlehem Steel Co., Bethlehem, Pa.

300 **Tons,** Washington, D. C., addition to building (C. & P.T.) to Lehigh Structural Steel Co., Allentown, Pa.

260 **Tons,** Winslow, Me., State Mile Brook bridge, to American Bridge Co., Pittsburgh.

225 **Tons,** Philadelphia Quartermasters Depot, underpasses, to Bethlehem Steel Co., Bethlehem, Pa.

200 **Tons,** Tonawanda Township, N. Y., building for Linde Air Products Co., to Bethlehem Steel Co., Bethlehem, Pa., through John W. Cowper Co.

200 **Tons,** Emsworth, Pa., wall armor, Emsworth Dam, Ohio River, for U. S. War Department, to American Bridge Co., Pittsburgh.

175 **Tons,** Niagara Falls, N. Y., building for Niagara Alkali Corp., to R. S. McManus Steel Construction Co., Inc., Buffalo.

145 **Tons,** Camden, N. J., New York Shipbuilding Co., steel for extensions to shipways U3 and U4, to American Bridge Co., Pittsburgh.

140 **Tons,** Syracuse, N. Y., plant additions for Onandaga Pottery Co., to American Bridge Co., Pittsburgh.

135 **Tons,** Chelsea, Mass., extension to main building, Naval Hospital, to an unnamed bidder.

115 **Tons,** Nassau County, N. Y., State highway bridge PSC-9778, to American Bridge Co., Pittsburgh.

THE SOUTH

6000 **Tons,** Richmond, Va., Quartermaster Depot warehouses, to Bethlehem Steel Co., Bethlehem, Pa.

1000 **Tons,** New Orleans, La., warehouse and factory building for International Harvester Co., to Jones & Laughlin Steel Corp., Pittsburgh.

576 **Tons,** Green Cove Springs, Fla., double landplane hangar for U. S. Navy, to Ingalls Iron Works Co., Birmingham.

546 **Tons,** Norfolk, Va., government storehouse, to Truscon Steel Co., Youngstown.

487 **Tons,** Sumpter, S. C., three hangars, to Southern Engineering Co., Charlotte, N. C.

340 **Tons,** Washington County, Ark., beam bridge, to Vincennes Steel Corp., Vincennes, Ind.

335 **Tons,** Fayetteville, Ark., State highway bridge, to Vincennes Steel Corp., Vincennes, Ind.

330 **Tons,** Kingsport, Tenn., addition to building for Tennessee Eastman Corp., to Bristol Steel & Iron Co., Bristol, Va.

303 **Tons,** Phenix, Va., State highway bridge, to Carolina Steel & Iron Co., Winston-Salem, N. C.

110 **Tons,** Nueces Bay, Tex., power house addition, to Mosher Steel Co., Houston, Tex.

CENTRAL STATES

2900 **Tons,** Ypsilanti, Mich., Ford Motor Co. hangar for bomber plant, to Whitehead & Kales Co., Detroit.

520 **Tons,** Lone Rock, Wis., State highway bridge, to Bethlehem Steel Corp., Bethlehem, Pa.

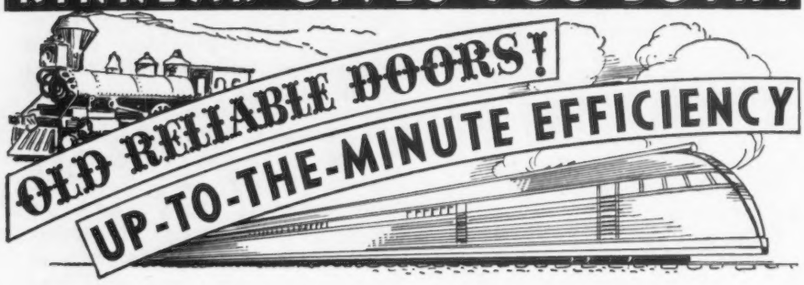
516 **Tons,** Marion County, Ind., highway bridge, to Central States Bridge & Structural Co., Indianapolis.

502 **Tons,** Logan County, Ill., bridge, to Mississippi Valley Structural Steel Co., St. Louis.

500 **Tons,** Detroit, gear and axle building for Chevrolet Motor division of General Motors Corp., to R. C. Mahon Co., Detroit.

490 **Tons,** Racine, Wis., J. I. Case Co. tractor plant, to Mississippi Valley Structural Steel Co., Decatur, Ill.

KINNEAR GIVES YOU BOTH!



From *your* point of view the most important thing about Kinnear Rolling Doors may be that their coiling upward action and interlocking slat construction give you *maximum* efficiency and convenience.

Or you may get even greater assurance from the fact that Kinnear Rolling Doors are backed by nearly *half a century* of proved dependability and economy.

Either way you look at it, Kinnear Rolling Doors meet your demand.

No other doors save more usable floor, wall, and ceiling space than Kinnear Rolling Doors. They open out of the way of all traffic or other plant operations.

And you get greater protection from their famous, all-steel interlocking-slat design (originated by Kinnear)! They resist fire, wind and weather. They repel intruders, troublemakers and saboteurs . . . withstand hard punishing use year after year.

Kinnear Rolling Doors are built to meet your particular requirements. Any size, for old or new buildings. Motor, manual or mechanical operation. Quick, easy installation is assured. Write to THE KINNEAR MANUFACTURING COMPANY, 1760-80 FIELDS AVENUE, COLUMBUS, OHIO, U. S. A.

SAVING WAYS IN DOORWAYS

KINNEAR ROLLING DOORS

400 **Tons,** Trenton, Mich., building for Monsanto Chemical Co., to Fort Pitt Bridge Works, Pittsburgh.

374 **Tons,** Bay City, Mich., factory building for Chevrolet Motor division of General Motors Corp., to R. C. Mahon Co., Detroit.

297 **Tons,** Joliet, Ill., power line for Public Service Co. of North Illinois, to American Bridge Co., Pittsburgh.

WESTERN STATES

775 **Tons,** San Diego, Cal., Consolidated Aircraft Corp. experimental building addition, to Bethlehem Steel Co., Los Angeles.

550 **Tons,** Ogden, Utah, power house and other buildings at Utah General Depot, to Kansas City Structural Steel Co., Kansas City, through James I. Barnes Construction Co., Santa Monica, Cal., Contractor.

315 **Tons,** Shasta Dam, Cal., roof framing, Shasta power plant specification No. 1520-D for U. S. Bureau of Reclamation, to American Bridge Co., Pittsburgh.

242 **Tons,** Cutbank, Mont., State highway bridge, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.

170 **Tons,** Cut Bank, Mont., State bridge, Cut Bank Creek, FAP-147-(2), to American Bridge Co., Pittsburgh.

PENDING STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

1575 **Tons,** Sayreville and Madison Townships, N. J., Cheesequake Creek bridge, bids Aug. 22, State House Annex, Trenton, N. J.

750 **Tons,** New York, track stringers, Manhattan Bridge.

400 **Tons,** Commonwealth of Pennsylvania, Camp Hill Industrial School, bids taken.

360 **Tons,** Norwich, N. Y., grade crossing elimination; bids Aug. 27.

350 **Tons,** Middlesex County, N. J., State bridge over Cheesequake Creek.

200 **Tons,** North Tonawanda, N. Y., building for Buffalo Bolt Co.

175 **Tons,** Steuben County, N. Y., highway bridge; bids Aug. 27.

163 **Tons,** Woodbury, N. J., underpass at Pennsylvania - Reading Seashore lines, bids, Aug. 22, State House Annex, Trenton, N. J.

150 **Tons,** Brooklyn, N. Y., aprons, hinge girders, etc., for Long Island Railroad Co.

120 **Tons,** Sharon, Pa., building extension for Westinghouse Electric & Mfg. Co.

110 **Tons,** Trafford, Pa., building extension for Westinghouse Electric & Mfg. Co.

100 **Tons,** Jefferson County, N. Y., bridge; bids Aug. 27.

THE SOUTH

3900 **Tons,** Miami, Fla., Biscayne Bay Causeway bridges for Dade County.

2400 **Tons,** Madison-Fayette Counties, Ky., superstructure, Clays Ferry Bridge.

2200 **Tons,** Lenoir City, Tenn., upper and lower lock gates, Ft. Loudoun Dam for TVA.

140 **Tons,** Gilbertsville, Ky., draft tube gates, Kentucky Dam for TVA.

CENTRAL STATES

650 **Tons,** Charlevoix, Mich., State bascule bridge over Pine River.

160 **Tons,** Various locations, repairs to bridges for Chicago, Milwaukee, St. Paul & Pacific Railroad Co.

WESTERN STATES

540 **Tons,** Bonneville, Ore., 16 steel inlet gates for Bonneville Power House; bids Aug. 19.

220 **Tons,** Skagit County, Wash., railroad bridges for city of Seattle; bids Aug. 14.

200 **Tons,** Portland, Ore., Bonneville transmission line crossing, Willamette River (Invitation 2116); bids in.

FABRICATED PLATES

Pending Projects

1750 **Tons,** Sandusky, Ohio, water line for Plum Brook Ordnance. Bids are in.

Reinforcing Steel

Awards of 8440 tons; 27,000 tons in new projects.

AWARDS

ATLANTIC STATES

350 **Tons,** Lakehurst, N. J., hangar, barracks, service building for U. S. Naval Station, to Truscon Steel Co., Youngstown, through Karno Smith Co. and Duffy Construction Co.

Weekly Bookings of Construction Steel

Week Ended →	Aug. 12, 1941	Aug. 5, 1941	July 15, 1941	Aug. 13, 1940	Year to Date 1941	Year to Date 1940
Fabricated structural steel awards	32,880	26,700	11,150	21,400	910,910	943,790
Fabricated plate awards	0	800	3,000	4,600	94,465	94,465
Steel sheet piling awards	0	0	0	390	20,630	20,630
Reinforcing bar awards	8,440	22,250	11,310	11,750	395,005	436,325
Total Letting of Construction Steel	41,320	49,750	25,460	38,140	1,421,010	1,462,330

270 **Tons,** mesh, Chicopee, Mass., airway runways, to American Steel & Wire Co., Worcester, Mass.

250 **Tons,** Buffalo, N. Y., grain elevator for Standard Milling Co., to Truscon Steel Co., Youngstown, through McKenzie-Hague Co.

212 **Tons,** Rome, N. Y., mesh for Army Air Corps, to Truscon Steel Co., Youngstown, through Turner Construction Co. and Lewis Mayersohn, contractors.

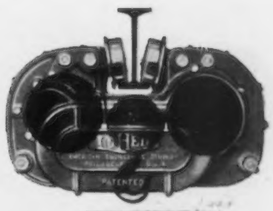
200 **Tons,** Tonawanda, N. Y.; Linde Air Products Co. building, to Bethlehem

AMERICAN ENGINEERING COMPANY

The Lo-Hed Hoist Is Applicable To Any Monorail System. There's A Balanced Lo-Hed Electric Hoist For Every Purpose

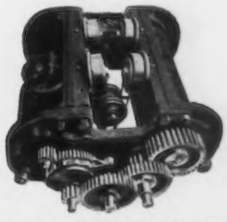
OTHER A-E-CO PRODUCTS: TAYLOR STOKERS, MARINE DECK AUXILIARIES, HELE-SHAW FLUID POWER

Look in your Classified Telephone Directory under "A-E-CO LO-HED HOISTS" for your nearest representative.



BALANCE COUNTS IN A HOIST

LO-HED, the *Balanced* Hoist. You can readily see that there is a difference in appearance between a Lo-Hed and other electric hoists. But do you know what this difference means to you? The motor and drum of a Lo-Hed hoist are placed on opposite sides of the beam. This unique, balanced arrangement, combined with efficient spur gearing, provides low headroom, low maintenance, maximum accessibility and great structural strength. A Lo-Hed hoist costs less per lift. Write for Lo-Hed catalog today.



LOOK AT THE BALANCED LO-HED!

It Costs Less To Operate—All gears are efficient stub-tooth spur gears running in a sealed oil bath . . . gear shafts and trolley wheels are equipped with heavy-duty ball or roller bearings.

It Costs Less To Maintain—Sturdy construction . . . seldom, if ever, requires removal from rail . . . covers of controller, motor, drum and gearing are easily removed.

It's Safe—Factor of safety of over 5 at full capacity . . . 100% Positive Automatic Stop when load reaches upper limit . . . Automatic Holding Brake prevents load from drifting when current is shut off . . . short, strong shafts minimize torsional stresses.

It's Protected—Controller is fire, dust and moisture proof . . . motor totally enclosed . . . gearing sealed in . . . motor and drum covered by easily removable covers.

AECO LO-HED HOISTS

AMERICAN ENGINEERING CO.
2410 Aramingo Avenue, Philadelphia

☐ Please send me your complete catalog of LO-HED HOISTS.

☐ Ask your representative to get in touch with me promptly.

Name .....
Company .....
Street Address .....
City ..... State .....
(Please print plainly)

Steel Co., Bethlehem, Pa.; John W. Cowper Co., contractor.

190 Tons, Hopedale, Mass., Draper Corp. plant to Truscon Steel Co., Boston.

175 Tons, St. Johnsbury, Vt., project Sn-SAGN-118-D, St. Johnsbury overpass, to Truscon Steel Co., Youngstown, through C. I. Hosmer, contractor.

100 Tons, Philadelphia, processing tower for Bigler Chemical Corp., to Truscon Steel Co., Youngstown, through F. H. Levin, contractor.

THE SOUTH

1200 Tons, Hope, Ark., Southwestern proving grounds, 700 tons to Laclede Steel Co., St. Louis, and 500 tons to Truscon Steel Co., Youngstown, O., through W. E. Callahan, contractor.

320 Tons, Chickasaw County, Iowa, paving, to Sheffield Steel Corp., Kansas City.

300 Tons, Barrington, Ill., Jewel Food Stores building, to Joseph T. Ryerson & Son, Inc., Chicago; Dahl-Steadman, contractor.

198 Tons, Drasmere, Ala., defense project No. 6725 for E. I. du Pont de Nemours Co., to Truscon Steel Co., Youngstown.

140 Tons, Jacksonville, Fla., mesh for U. S. Naval Air Station, to Truscon Steel Co., Youngstown, through Sherman Concrete Pipe Co.

280 Tons, Sacramento, Cal., 14 warehouses at McClellan Field, to Ceco Steel Products Co., San Francisco, through James I. Barnes Construction Co., Santa Monica, Cal., contractor.

200 Tons, Berkeley, Cal., University of California women's dormitory, to Gilmore Fabricators, Inc., Berkeley, through K. E. Parker Co., San Francisco, contractor.

175 Tons, Redding, Cal., Central Valley project (Invitation A-33,295-A), to Columbia Steel Co., San Francisco.

151 Tons, Earp, Cal., Parker Power Plant (Invitation A-44,383-A), to Bethlehem Steel Co., San Francisco.

126 Tons, San Diego, Cal., barracks 1 and 2 and storehouse at Naval Destroyer Base, to Truscon Steel Co., Youngstown, through J. Harvey Chambers, contractor.

100 Tons, Long Beach, Cal., housing project at San Antonio and Cherry Avenues, to Blue Diamond Corp., Los Angeles.

PANAMA CANAL ZONE

500 Tons, Panama Canal Zone, Navy base, to Jones & Laughlin Steel Corp., Pittsburgh; Frederick Snare, Inc., contractor.

BRITISH WEST INDIES

3000 Tons, Jamaica, B.W.I., for Army base, U. S. Engineers, Caribbean Division, to Jones & Laughlin Steel Service, Inc., Brooklyn; Jamaica Base Contractors, New York, contractor.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

1500 Tons, Weymouth, Mass., lighter than air base; Sawyer Construction Co. and Barletta Co., Boston, contractors.

800 Tons, Pittsburgh, Glen Hazel Heights defense housing; bids taken.

500 Tons, Fairfield, Conn., defense housing 6071-X; bids taken.

500 Tons, Jersey City, N. J., Booker T. Washington apartments; Auf-der-Heide-Aragona, contractor.

400 Tons, Salem, Mass., State highway bridge; bids taken.

375 Tons, Corning, N. Y., U. S. Engineer, flood control project; bids Aug. 14.

317 Tons, Sayreville and Madison Townships, N. J., Cheesequake Creek bridge, bids Aug. 22, State House Annex, Trenton, N. J.

300 Tons, Lynn, Mass., gear manufacturing plant, General Electric Co.; bids taken.

120 Tons, Great Bend, N. Y., Pine Camp Army airport.

100 Tons, Philadelphia, Publicker Alcohol Co. building.

SOUTH AND CENTRAL

5700 Tons, Texarkana, Tex., Lone Star ordnance plant.

4000 Tons, Memphis, Tenn., Army depot.

2000 Tons, Burns City, Ind., Naval Ordnance plant addition.

1000 Tons, Wichita, Kan., Boeing Aircraft plant.

1000 Tons, Milwaukee, Allis-Chalmers supercharger plant.

600 Tons, Minneapolis, grain elevator.

500 Tons, Ft. Belvoir, Va., engineering board equipment depot buildings; Charles H. Tompkins, contractor.

170 Tons, Detroit, American Blower Corp.

160 Tons, Moline, Ill., stadium.

150 Tons, Grennell, Iowa, Cowles Dormitory, Grennell College.

100 Tons, Milwaukee, A. O. Smith Corp.

WESTERN STATES

6000 to 7000 tons, San Francisco, Metropolitan Life Insurance Company's Parkmerced housing project.

100 Tons, Fergus County, Mont., viaduct.

100 Tons, Blain County, Mont., bridge.

Pipe Lines

● **Trans-American Pipe Line Corp.,** Waggoner Building, Fort Worth, Tex., plans new welded steel pipe line from oil field area in vicinity of Wichita Falls, Tex., to Savannah, Ga., about 1050 miles, for crude oil transmission to deep water terminal to be located at latter place. Line will be 10-in. for first 300 miles, and 12-in. for remainder of distance, 750 miles. Cost close to $25,000,000 with booster pumping stations and other operating facilities.

General Purchasing Officer, Panama Canal, Washington, asks bids until Aug. 19 for 2400 lin. ft. of 8-in. plain steel pipe (Schedule 5375).

For Plant Extension and Modernization

BRASSERT OFFERS YOU..

An Outside Viewpoint with "Inside" Information

You draw upon a vast fund of information and data when you call upon BRASSERT to help with your plant modernization, or extension projects.

H. A. Brassert & Co. for many years has been engaged in consulting and construction work for the iron and steel industry, here and abroad. Thus we can bring to bear upon your problems not only the valuable "outside" viewpoint, but also a wide experience covering every phase of steel mill engineering.

It will pay to call BRASSERT before proceeding with plant extensions or modernization.

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Engineers and Contractors
FIRST NATIONAL BANK BUILDING, PITTSBURGH, PA.
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BRASSERT SERVICE INCLUDES:

Consulting engineering covering technical, commercial and financial aspects of present or prospective enterprises. ● Design and construction of complete plants, extensions and modernization. ● Design and manufacture of specialized equipment and machinery.

NON-FERROUS METALS

. . . MARKET ACTIVITIES AND PRICE TRENDS

OPACS Sets Copper Price, Ceiling; More Tin Ore Purchased

• • • **The non-ferrous** market spotlight focussed this week on OPACS establishment of ceiling prices for copper, the announcement of the personnel of the Joint Copper and Zinc Defense Industry Advisory Committee, the Metals Reserve Co.'s purchase of concentrates containing 20,000 tons of tin and its arrangement to store 50,000 tons of zinc concentrates at El Paso, Tex.

A ceiling of 12c. a lb. on copper, the prevailing price for nearly a year in mine circles, was announced by OPACS, effective August 12, applying to electrolytic grade in the shape of wire or ingot delivered in carload lots at Connecticut Valley points. A top price of 11¾c. was set for casting copper made by fire refining to a standard of 99.5 per cent pure. Premiums ranging from 3.4c. to 2c. a lb. are allowed for less-than carload lots sold by others than refiners or producers.

The Joint Copper-Zinc Defense Industry Committee consists of 35 members, representing five divisions of industry: copper producers, zinc producers, brass and copper sheet roller and tube formers, copper wire and cable manufacturers, and zinc fabricators. John A. Church, of the Division of Priorities, is the presiding officer of the committee, representing the government.

NON-FERROUS PRICES

(Cents per lb. for early delivery)

Copper, Electrolytic[1]	12.00
Copper, Lake	12.00
Tin, Straits, New York	*52.75
Zinc, East St. Louis[2]	7.25
Lead, St. Louis[3]	5.70

[1] Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery. * Average for week.

Other Non-Ferrous Prices

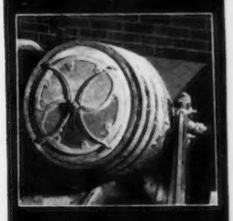
Aluminum, delivered: virgin, 99 per cent plus, 17c.-18c. a lb.; No. 12 remelt No. 2, standard, 16c. a lb. **Nickel** electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. **Antimony**, prompt, Asiatic, 16.50c. a lb., New York; American, 13c. a lb., f.o.b. smelter. **Quicksilver**, $190, per flask of 76 lb. **Brass Ingots**, commercial 85-5-5-5, 13.25c. a lb.

American tin trade was deeply interested in the agreement Metals Reserve Co. made with the Bank and Billiton tin interests in the Netherlands East Indies, to buy concentrates containing 20,000 tons per year of fine tin for processing at the new smelter in Texas, which is expected to be in operation this winter.

The erection of a zinc smelter at El Paso, Tex., is being considered to refine the 50,000 tons of Mexican zinc concentrate that Metals Reserve Co., has arranged to store at that point. Domestic slab zinc production hit a new monthly high in July, according to reports from the American Zinc Institute. Production amounted to 66,419 tons, as compared to 62,236 tons produced during June. Shipments during July were up 927 tons to 64,086 tons, stocks gained 2333 tons to 9737 tons for July, and unfilled orders at the end of July amounted to 81,456 tons.

Between 45 000 and 50,000 tons of Mexican and Canadian lead are to be available if necessary for August shipments, and allocations for August have been made.

Prices continued stable during the past week. Copper prices held at 12c. a lb. Connecticut Valley, quoted by producers. It now appears that custom smelters are doing some business on the 12c. a lb. basis, in accordance with the new price schedule. Lead prices were 5.70c. a lb., St. Louis, and 5.85c. a lb., New York, while zinc prices were 7.25c. at East St. Louis and 7.60c. a lb., at New York. Tin prices gained 1c. from the 52c. level of last week.



Rockin'

On METALINE BEARINGS

To and fro—day by day—year by year—

Operation of equipment requiring rocking movement calls for METALINE Oilless Bronze Bearings. They will stand up indefinitely under the strain of this service. The velvety covering made by the METALINE over the bronze bearing on shaft surfaces provides trouble-free, frictionless motion. When cleanliness is a factor, remember METALINE Bearings use no oil or grease. There can be no drippage to injure material being processed.

Send for data on Rhoades Metaline Oilless Bronze Bearings and get our specific recommendations to meet your needs.

R. W. RHOADES METALINE CO., INC.

P. O. BOX 1 LONG ISLAND CITY, N. Y.

MACHINE TOOLS

. . . SALES, INQUIRIES AND MARKET NEWS

Tools Yet to be Bought For Bomber Program

New York

• • • **Except for a large** machine tool buying program on the part of Chevrolet in Buffalo in tooling up for producing the Pratt & Whitney engine, activity on the part of the original aircraft engine builders has yet to materialize in connection with the new bomber program. The total requirements in terms of productive machinery is well known to the machine tool builders, however, and a definite percentage of productive capacity for the next six months or more has been reserved for this purpose.

Expansion programs continue among the New England machine tool makers and when these new facilities come into being the industry feels that it will be definitely over the hump and that backlogs will be reduced rather than increased. On the other hand, new Russian inquiries may alter the picture, depending upon how much equipment the Department of State will allow to be shipped to the U.S.S.R. Inquiries for heavy presses for aircraft production are particularly heavy from this source.

The machine tool industry is still trying to digest the new priority order issued by OPM around the first of July. Some builders indicate that practically every order on the books will be realined after Aug. 15 or Sept. 15 (the deadline set by OPM, according to type of equipment made) in conformance with the critical plant lists for A-1-a and A-1-b. There are about 180 key defense contractors on the former list and 300 to 400 on the latter.

Locally, some of the larger dealers are still building up order backlogs, although some report that business is coming from only two or three sources—from companies making gun fire control apparatus and bomb sights like Ford Instrument Co. and Sperry Corp., both of which have large expansion programs under way.

Electrical Apparatus Scarce

Chicago

• • • **Purchasing activity in** machine tools has quieted in this sector. Manufacturers and users are beginning to experience difficulty getting electrical equipment for new machines. This is being accompanied by a growing problem in getting such parts as gears, etc., bought from contract shops. These are not serious obstacles by any means but some retardation is being noted in these directions and is causing greater concern.

Manufacturers are confronted with rescheduling production, probably to meet the bomber and anti-aircraft gun program. Greater demand is evinced for the largest sized equipment which is creating new bottlenecks. Vertical boring mills are getting tighter as one of the results. While deliveries on more popular sizes of equipment are in a definitely healthy shape, the larger sizes are lengthening alarmingly.

From "Trade Winds"

"What we ordered was a crankshaft balancer . . .!"

Composite Tool Saves High Speed Steel

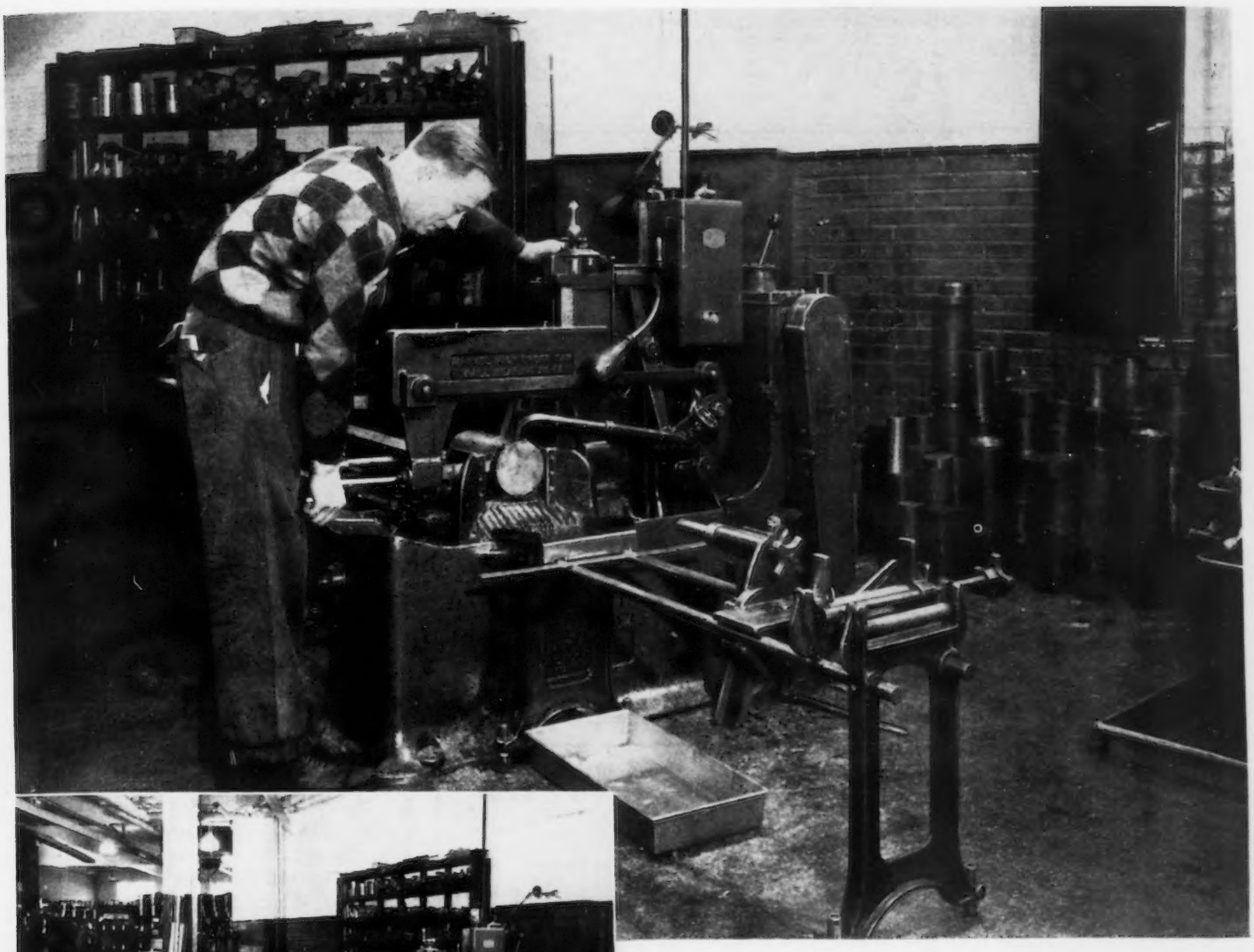
Ferndale, Mich.

• • • **With high speed steel** now on a highly restricted basis because of the impending shortage of strategic tungsten, various means are being taken to conserve this vital cutting material. A step in this direction has been taken by the Forgings & Castings Corp., Ferndale, which has announced a new line of electrically welded composite steel blanks for the making of dovetail forming cutters for use on automatic screw machines. The blanks are made by electrically welding a cutting face of high speed steel to a non-hardenable base of mild steel, thus reducing by at least one-half the quantity of high speed steel required for a tool of a given size.

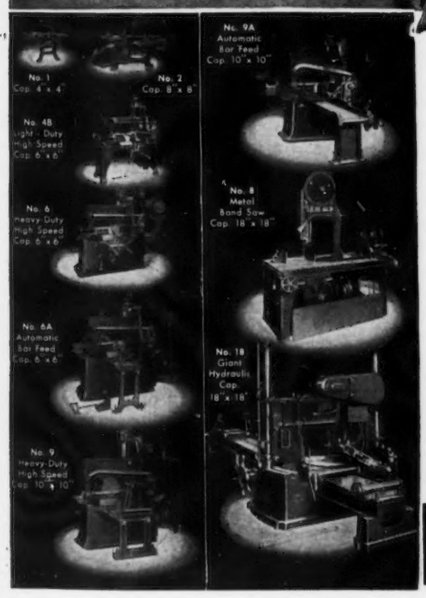
Besides conserving tungsten, these tool blanks have the important advantage that the non-hardenable tough base minimizes the inherent tendency of solid high speed tools to break out at the sharp dovetail corners or at the screw holes due to strains set up during heat treating, the manufacturer points out.

Porcelain Enamel Institute Plans Forum At Ohio State

• • • **Production problems** will be emphasized at the sixth annual forum of the Porcelain Enamel Institute, to be held from Oct. 8 to 10, at Ohio State University, Columbus, Ohio. Speakers and presiding officers will be: R. R. Danielson, vice president of the institute; Dean McQuigg, Engineering College of Ohio State; P. B. McBride, president of the institute; R. M. King, Ceramic Engineering Department, Ohio State; Carl Harbert, Harshaw Chemical Co., Cleveland; William W. Coffeen, institute research fellow; E. L. Heusch, Ohio supervisor of vocational trades in industry; C. L. Van Derau, Westinghouse Electric & Mfg. Co., Mansfield, Ohio, and N. G. Wedemeyer, Rohm & Haas, Inc., Philadelphia.



MARVEL SAWS



Cutting-off continuously at high speed at Wright Aeronautical Corporation.

Since the start of the National Defense Drive, these MARVEL PRODUCTION SAWS at the Wright Aeronautical Corporation, Paterson, N. J., have operated continuously; have been cutting-off "round and square stock, all kinds of alloy steel up to 10" D, and 10" Sq. and giving A-1 satisfaction."

When photographed, the MARVEL 9A was cutting-off S.A.E. 3140 Steel Tubing, $3\frac{1}{8}$" O.D. x $1\frac{7}{8}$" I.D. at the rate of a piece every minute and a half, while the MARVEL 6A was cutting a slice from a $5\frac{1}{2}$" D. Cold Rolled Steel bar every six minutes. These heavy duty all ball-bearing saws with automatic bar push-up, will cut-off more pieces, floor-to-floor, than any other cutting-off machine or method.

ARMSTRONG-BLUM MFG. CO. *"The Hack Saw People"*
5700 Bloomingdale Ave., Chicago, U. S. A. Eastern Sales: 225 Lafayette St., N. Y.

SCRAP

. . . MARKET ACTIVITIES AND PRICE TRENDS

OPACS Efforts To Fix Scrap Prices Slowly Collapsing

• • • **Despite intensified** efforts of defense officials to increase the flow of scrap and to hold prices to ceiling levels, the situation has degenerated to the point where desperate efforts to obtain scrap have caused an almost complete breakdown of price fixing efforts in scrap iron and steel. Revisions upward on some items announced last week by OPACS (see page 89) were largely a matter of recognizing an already existing condition.

While occasional district reports suggest that the higher prices prevailing currently have stimulated the flow of scrap, such increases have been insignificant in consideration of the extent of the scrap shortage. Practically speaking, the violations of the scrap ceilings have thus far served only to alter the direction of the flow of scrap, rather than the quantity.

Meanwhile the Department of Justice is getting under way in its investigation (requested by OPACS) of the alleged anti-trust practices in the scrap trade, while district reports to THE IRON AGE say that some dealers fear it will be necessary to go out of business if they attempt to observe the official ceilings while others exceed them.

Still a thorn in the side of domestic scrap users is the continued Canadian importation of scrap. In Buffalo, United States mills watch barges loaded with scrap for Hamilton, Ont., pass by their docks, while at the same time their own stock piles continued to grow smaller and smaller. Toronto reports that Canadian mills are seeking to buy still further tonnages in this country. One Hamilton mill is taking delivery on 15,000 tons of scrap from United States dealers. The maximum prices for scrap established in Canada do not apply on imported material.

Desperate mill buyers and their suppliers, seeking to tap new sources of scrap, are turning to community drives. While moderate tonnages have been realized from several of these drives now under way, observers are warning that such drives in themselves will not solve the scrap shortage.

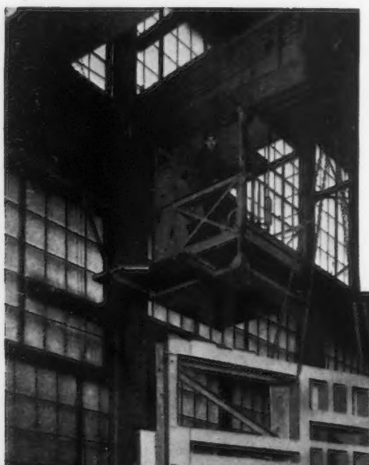
A request by OPACS that all old 1941 license plates be turned in for scrap was termed "ridiculous" by scrap officials who pointed out that the enamel coating would make the material unacceptable to steel mills without costly processing.

New England auto wreckers met last week with OPM officials and discussed methods of speeding up the scrapping of old cars. This follows a similar meeting held recently in Ohio.

Pittsburgh—The upward revision in the ceiling price of some low phos. grades and steel axle turnings utilized in electric steel production, has brought a slight increase in the flow of material here but as yet has not had the effect which some sources had expected. Supplies of primary No. 1 heavy melting steel are still hard to pick up and consumers are being forced to take whatever they can get, the result of which is further loss of efficiency in open hearth furnaces. That the situation continues serious is found in the fact that relaxation in scrap specifications and overgrading of some material still continues.

Youngstown—The inflow of scrap here is not enough to support present operations and some companies insist that additional and better scrap must be forthcoming soon if steel output is not to be importantly affected.

Cleveland—Brokers and dealers here report no change in the difficulty in obtaining primary scrap grades and even secondary scrap is not being picked up in sufficient quantities to meet consumer



Welding economy is never obtained this way . . . . .

It is the interval between welds, the *positioning* time that eats into the profits of production welding. Eliminate the *extra* moves and you save money right away. You can do it by "setting-up" *just once* on a C-F Positioner for *all* welds . . top, bottom and sides.

Here are three men and a crane positioning a weldment which the idle *welder could do himself* without *any* help if it were set up on a C-F Positioner. Furthermore, "down-hand" welds are better welds and C-F Positioned welds are *all* "down-hand" welds.

Q. E. D.

Write today for our informative circular WP20 which explain the C-F Positioner method of better, safer and more economical welding.

CULLEN-FRIESTEDT CO.,
1303 S. KILBOURN AVE. CHICAGO, ILLINOIS.

Lukens Expects 100 Tons Scrap Daily From Drive

Coatesville, Pa.

• • • About 100 tons of scrap a day, for a limited length of time, is expected to come into the Lukens Steel Co. plant here, as a result of the company's advertisements in local papers and in surrounding communities describing their urgent need for more scrap.

It was reported that the ads enlisted the support of employees and their friends throughout the area, and results obtained were far in excess of what was expected. The flood of telephone calls that started as soon as the papers were on the street necessitated enlistment of clerical aid to act as a clearing house and secure necessary information to obtain the scrap, which is being turned over to local dealers.

↓ ↓

Middletown, Ohio

• • • The community drive for scrap steel sponsored by American Rolling Mill Co. here has brought 8400 tons of scrap to the plant up to Aug. 6, company officials report. Scrap dealers are cooperating wholeheartedly in the drive.

demand. Operations of open hearths are being affected by the type of scrap received and in some instances it is believed that unless a greater amount is forthcoming, actual units may be taken off soon.

Chicago—Flow of scrap increased last week to a slight extent for no apparent reason. One railroad reports that a survey it is making over its road reveals surprisingly little amount of scrap in small outlying towns. A few mill purchasers have voiced the opinion that removal of the ceilings will bring out more scrap.

Detroit—No action has been taken on the Detroit Street Railway scrap list which last week brought bids from a group of Detroit dealers above the Government established maximums. The DSR purchasing department has referred the bids to the DSR commission without revealing what recommendations he was making. It is understood, however, that this city department has been advised by OPACS not to accept prices above the OPACS schedule. Overgrading of material is on the increase.

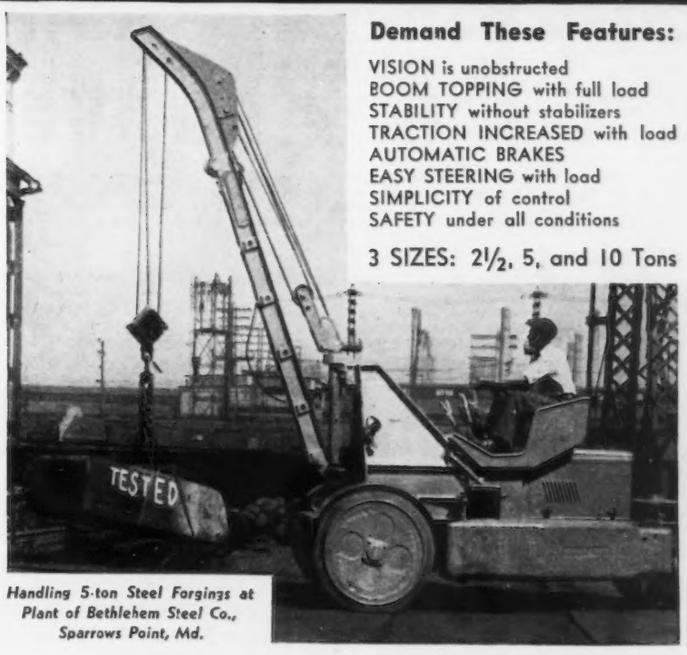
Cincinnati—Scrap collection campaigns here have not yet produced sufficient material to ease the situation. Portsmouth unit of the Wheeling Steel Corporation is still operating only 8 open hearths because of the scrap shortage.

Buffalo — Apprehension is apparent among local steel mills and foundries as scrap being offered for consumption is falling far short of what is required to assure maintenance of the present high industrial rate in the weeks and months ahead. Incoming shipments at all Buffalo mills are said to be well below the rate of consumption. A few local scrap yards are working night and day in attempting to keep scrap moving to the mills just as fast as it is received. Canadian sources continue to come into our markets for scrap, a condition which is permitted despite the lack of offerings here.

Toronto—Demand for both steel and iron scrap materials exceeds supply, and dealers and consumers are predicting severe shortage in the not distant future. To augment the domestic supply efforts are being directed toward larger purchases in the United States, but it is claimed there is some difficulty in obtaining scrap across the line. One large Hamilton consumer now is receiving delivery on some 15,000 tons of steel scrap from the States.

(Scrap Prices on Next Page)

KRANE KAR SWING BOOM TRACTOR CRANE



Handling 5-ton Steel Forgings at Plant of Bethlehem Steel Co., Sparrows Point, Md.

Demand These Features:

VISION is unobstructed
BOOM TOPPING with full load
STABILITY without stabilizers
TRACTION INCREASED with load
AUTOMATIC BRAKES
EASY STEERING with load
SIMPLICITY of control
SAFETY under all conditions

3 SIZES: 2½, 5, and 10 Tons

Speed for Defense!

UNMATCHED PERFORMANCE . . . high speed, maneuverability, versatility for various applications . . . makes Krane Kar a defense need . . . a must to expedite handling and moving defense goods. Compare its performance point by point . . . and choose Krane Kar!

Among the Users: Bethlehem Steel, Carnegie-Illinois Steel, American Steel & Wire, Keystone Steel & Wire, Otis Elevator, Wm. Sellers & Co., etc.

Write for Bulletin No. 55, with illustrations and specifications

Agents in the Principal Cities

SILENT HOIST WINCH & CRANE CO.
851 63rd ST., BROOKLYN, N.Y.

Iron and Steel Scrap (other than railroad scrap)

(Maximum basing point prices, as revised by OPACS to Aug. 8, 1941, from which shipping point prices and consumers' delivered prices are to be computed, per gross ton)

Basing Points → / ▼ GRADES	Pittsburgh	Johnstown Wierton Steubenville Youngstown Warren Sharon Canton	Chicago	Kokomo	Bethlehem	Claymont Coatesville Phoenixville Harrisburg	Sparrows Point	Buffalo	Cleveland	Toledo	Portsmouth Middletown Ashland	St. Louis	Detroit	Duluth Minneapolis*	Birmingham	Chattanooga	Radford, Va.	Worcester Bridgeport Phillipsdale, R. I.	Los Angeles San Francisco Seattle Portland	Minnequa, Colo.
No. 1 heavy melting	$20.00	$20.00	$18.75	$18.25	$18.25	$18.75	$18.75	$19.25	$19.50	.....	$19.50	$17.50	$17.85	$18.00	$17.00	.....	.....	.....	14.50	16.50
No. 1 hyd. comp. black sheet	20.00	20.00	18.75	18.25	18.25	18.75	18.75	19.25	19.50	.....	19.50	17.50	17.85	18.00	17.00	.....	.....	.....	14.50	16.50
No. 2 heavy melting	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.25	18.50	.....	18.50	16.50	16.85	17.00	16.00	.....	.....	(See footnotes)	13.50	15.50
Dealers' No. 1 bundles	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.25	18.50	.....	18.50	16.50	16.85	17.00	16.00	.....	.....		13.50	15.50
Dealers' No. 2 bundles	18.00	18.00	16.75	16.25	16.25	16.75	16.75	17.25	17.50	.....	17.50	15.50	15.85	16.00	15.00	.....	.....		12.50	14.50
Mixed borings and turnings	15.25	15.25	14.00	14.25	13.50	14.00	14.00	14.50	14.75	13.10	14.75	12.75	13.10	.....	12.25				9.75	11.75
Machine shop turnings	15.50	15.50	14.25	14.50	13.75	14.25	14.25	14.75	15.00	13.35	15.00	13.00	13.35	15.50	15.00	Alloy, W.Va. 17.60		.....	10.00	12.00
Shoveling turnings	16.50	16.50	15.25	15.50	14.75	15.25	15.25	15.75	16.00	14.35	16.00	14.00	14.35	16.50	.....	.....	.....	.....	11.00	13.00
No. 1 busheling	19.50	19.50	18.25	17.75	17.75	18.25	18.25	18.75	19.00	.....	19.00	17.00	17.35	17.50	16.00	.....	.....	.....	14.00	16.00
No. 2 busheling	15.50	15.50	14.25	13.75	13.75	14.25	14.25	14.75	15.00	.....	15.00	13.00	13.35	13.50	12.50	.....	.....	.....	10.00	12.00
Cast iron borings	15.75	15.75	14.50	14.00	14.00	14.50	14.50	15.00	15.25	13.60	[6]15.25	13.25	13.60	13.75	12.75	.....	.....	.....	10.25	12.25
Uncut structural, plate scrap	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.25	18.50	.....	18.50	18.50	16.85	17.00	16.00	.....	.....	.....	13.50	15.50
No. 1 cupola	21.00	21.00	20.00	20.00	22.50	23.00	22.00	20.00	22.00	.....	21.00	20.00	20.35	*19.00	20.00	20.50	21.00	22.00	18.00	.....
Heavy breakable cast	19.50	19.50	18.50	18.50	21.00	21.50	21.00	18.50	20.50	.....	19.50	18.50	18.85	*17.50	18.50	.....	.....	20.50	17.00	.....
Stove plate	19.00	[5]19.00	17.00	16.00	18.00	18.50	18.00	19.00	18.00	15.60	17.50	17.00	14.10	*16.00	17.00	17.50	18.00	17.50	14.00	.....
Low phos. billet, bloom crops	25.06	25.00	23.75	23.75	23.25	23.75	23.75	24.25	24.50	.....	23.50	22.50	22.85	23.00	22.00	.....	.....	.....	19.50	.....
Low phos. bar crops, smaller	23.00	23.00	21.75	21.75	21.25	21.75	21.75	22.25	22.50	.....	21.50	20.50	20.85	21.00	20.00	.....	.....	.....	19.50	.....
Low phos. pu'ch'gs., plate scrap[1]	24.75	23.00	21.75	21.75	21.25	21.75	21.75	22.25	22.50	.....	21.50	20.50	20.85	21.00	20.00	.....	.....	.....	17.50	.....
Machinery cast, cupola size[2]	22.00	22.00	21.00	21.00	23.50	24.00	23.50	21.00	23.00	.....	22.00	21.00	21.35	*20.00	21.00	21.50	22.00	23.00	19.00	.....
No. 1 mach. cast, drop-broken, 150 lb. and under	22.50	22.50	21.50	21.50	24.00	24.50	24.00	21.50	23.50	.....	22.50	21.50	21.85	20.50	21.50	22.00	22.50	23.50	19.50	.....
Clean auto cast	22.50	22.50	21.50	21.50	24.00	24.50	24.00	21.50	23.50	.....	22.50	21.50	21.85	20.50	21.50	22.00	22.50	23.50	19.50	.....
Punchings and plate scrap[3]	23.75	22.00	20.75	20.75	20.25	20.75	20.75	21.25	21.50	.....	20.50	19.50	19.85	20.00	19.00	.....	.....	.....	16.50	.....
Punchings and plate scrap[4]	22.75	21.00	19.75	19.75	19.25	19.75	19.75	20.25	20.50	.....	19.50	18.50	18.85	19.00	18.00	.....	.....	.....	15.50	.....
Heavy axle, forge turnings	21.25	19.50	18.25	18.25	17.75	18.25	18.25	18.75	19.00	.....	18.00	17.00	17.35	17.50	16.50	.....	.....	.....	14.00	.....
Medium h'vy. el. f'ce. turnings	19.75	18.00	16.75	16.75	16.25	16.75	16.75	17.25	17.50	.....	16.50	15.50	15.85	16.00	15.00	.....	.....	.....	12.50	.....

[1] This grade is ⅜-in. and heavier, cut 12 in. and under. [2] May include clean agricultural cast. [3] Under ⅜ to ¼-in., cut 12 in. and under. [4] Under ¼-in. to No. 12 gage, cut 12 in. and under. [5] Youngstown, Warren, Sharon and Canton are not basing points on this grade. [6] Middletown price for this grade is $15. * Minneapolis and St. Paul are basing points on following grades only: No. 1 cupola, heavy breakable cast, stove plate, machinery cast cupola size, No. 1 machinery cast drop broken, clean auto cast.

Railroad Scrap *(Per gross ton, delivered consumers' plants located on line of railroad originating scrap)*

Where the railroad originator of the scrap operates in two or more of the basing points named, the highest of the maximum prices established for such basing points shall be the maximum price of the scrap delivered to a consumer's plant at any point on the railroad's line, except that Chicago consumers of scrap originating from railroads operating in Chicago are permitted to pay as much as 84c. a gross ton in switching charges above the maxima.

Basing Points → / ▼ GRADES	Pittsburgh Sharon, Pa. Wheeling Steubenville Youngstown Canton	Chicago	Kokomo	Philadelphia	Wilmington	Sparrows Point	Cleveland	Buffalo	Portsmouth Middletown Ashland	St. Louis	Kansas City	Detroit	Duluth	Birmingham	Los Angeles San Francisco Seattle
No. 1 heavy melting	$21.00	$19.75	$19.25	$19.75	$19.75	$19.75	$20.50	$20.25	$20.50	$18.50	$17.00	$18.85	$19.00	$18.00	$15.50
Scrap rails	22.00	20.75	20.25	20.75	20.75	20.75	21.50	21.25	21.50	19.50	18.00	19.85	20.00	19.00	16.50
Rerolling rails*	23.50	22.25	21.75	22.25	22.25	22.25	23.00	22.75	23.00	21.00	19.50	21.35	21.50	20.50	18.00
Scrap rails 3 ft. and under	24.00	22.75	22.25	22.75	22.75	22.75	23.50	23.25	23.50	21.50	20.00	21.85	22.00	21.00	18.50
Scrap rails 2 ft. and under	24.25	23.00	22.50	23.00	23.00	23.00	23.75	23.50	23.75	21.75	20.25	22.10	22.25	21.25	18.75
Scrap rails 18 in. and under	24.50	23.25	22.75	23.25	23.25	23.25	24.00	23.75	24.00	22.00	20.50	22.35	22.50	21.50	19.00

* Relaying quality $5 higher.

Explanatory Notes

(A basing point includes its switching district.)

MAXIMUM PRICE at which any grade of scrap may be delivered to consumer's plant, wherever located, is the shipping point price, plus actual transportation from the shipping point to consumer. Where shipment is by water, actual handling charges at the dock of not more than 75c. a gross ton may be included as part of transportation charges. In no case may this maximum price exceed by more than $1 for prices (for material other than railroad scrap) for the basing point nearest the consumer.

COMPUTING SHIPPING POINT PRICE: A shipping point is the point from which scrap is to be shipped to consumer and is calculated by subtracting the lowest established charge for transporting scrap from the shipping point to the nearest basing point. The following are exceptions: The shipping point price at any shipping point in New England, of those grades for which no prices are listed at the basing points established for New England, shall be the Johnstown basing point price, minus all-rail transportation costs from the New England shipping point to Johnstown. However, the shipping point price at any shipping point in New England of those grades of scrap for which prices are listed at the basing points in New England shall be computed from those New England basing point prices.

REMOTE SCRAP: Material located beyond the zone from which the railroad freight rate to Pittsburgh is $11.20 is called remote scrap. Consumers desiring to purchase such scrap, but unable to do so without exceeding the ceiling prices, may make application to OPACS for permission to absorb the excess freight charges.

UNPREPARED SCRAP: Regardless of source, maximum price of unprepared scrap is $2.50 less than maximum for corresponding grade of prepared scrap.

BILLET AND BLOOM CROPS: Where such material originates in the Pittsburgh basing point, it may be sold delivered to a consumer within or without the Pittsburgh point at the price given in Schedule A, plus not more than $2.50 in transportation charges. Lowest established transportation charges will govern.

Non-Ferrous Scrap Prices (Dealers buying prices, cents per lb.)

	New York	Philadelphia	Pittsburgh	Cleveland	Detroit	Chicago
No. 1 heavy copper	10.75-11.00	11.125-11.375	10.25	11.00-11.50	10.00	10.50-10.75
Light copper	8.75-9.00	9.125-9.375	8.25	9.00-9.25	8.00	8.50-8.75
Heavy yellow brass	6.50-6.75	7.50-7.75	7.00-7.25	7.50-8.00	6.50	7.00-7.25
Light brass	5.75-6.00	6.50-6.75	6.00-6.25	6.00-6.50	5.75	6.50-6.75
No. 1 comp. turnings	9.50-9.75	9.50-9.75	9.00	9.50-10.00	8.50	9.00-9.25
New yellow brass clips	8.00-8.25	8.00-8.50	8.00-8.50	8.50-8.62½	8.625	8.50-8.625
Soft lead	5.25-5.50	5.25-5.50	4.75-5.00	4.75-5.00	4.50-4.75	4.75-5.00
Old zinc	4.00-4.25	4.25-4.50	4.00	4.00-4.125	4.50-4.75	4.25-4.50
Cast forged aluminum	12.00*	12.00*	12.00*	12.00*	12.00*	12.00*
Old sheet aluminum	12.50*	12.50*	12.50*	12.50*	12.50*	12.50*
Solder joints	8.75-9.00	9.00	8.00-8.25	8.00-8.50	7.00-7.50	7.50-8.00
No. 1 pewter	36.00-37.00	35.00-36.00	31.00-32.00	34.00-35.00	29.00-30.00	32.00-34.00

* OPACS maximum for sale by dealer.

. . . Comparison of Prices

(Advances Over Past Week in **Heavy Type**; Declines in *Italics*)

	Aug. 12, 1941	Aug. 5, 1941	July 15 1941	Aug. 13, 1940
Flat Rolled Steel:				
(Cents Per Lb.)				
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terne Plate:				
(Dollars Per Base Box)				
Tin plate	$5.00	$5.00	$5.00	$5.00
Manufacturing ternes	4.30	4.30	4.30	4.30
Bars and Shapes:				
(Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wire and Wire Products:				
(Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails:				
(Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel:				
(Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	34.00	34.00	34.00	34.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00
Wire Rods and Skelp:				
(Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

	Aug. 12, 1941	Aug. 5, 1941	July 15 1941	Aug. 13, 1940
Pig Iron:				
(Per Gross Ton)				
No. 2 fdy., Philadelphia	$25.84	$25.84	$25.84	$24.84
No. 2, Valley furnace	24.00	24.00	24.00	23.00
No. 2, Southern Cin'ti	24.06	24.06	24.06	23.06
No. 2, Birmingham	20.38	20.38	20.38	19.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	23.00
Basic, del'd eastern Pa.	25.34	25.34	25.34	24.34
Basic, Valley furnace	23.50	23.50	23.50	22.50
Malleable, Chicago†	24.00	24.00	24.00	23.00
Malleable, Valley	24.00	24.00	24.00	23.00
L. S. charcoal, Chicago	31.34	31.34	31.34	30.34
Ferromanganese‡	120.00	120.00	120.00	120.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton. ‡For carlots at seaboard.

Scrap:				
(Per Gross Ton)				
Heavy melting steel, P'gh	$20.00	$20.00	$20.00	$18.50
Heavy melting steel, Phila	18.75	18.75	18.75	19.50
Heavy melting steel, Ch'go	18.75	18.75	18.75	17.875
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.25
Low phos. plate, Youngs'n	23.00	23.00	23.00	21.75
Carwheels, Chicago	....	....	....	18.25
Carwheels, Philadelphia	....	....	....	21.25
No. 1 cast, Pittsburgh	22.00	22.00	22.00	19.75
No. 1 cast, Philadelphia	24.00	24.00	24.00	21.25
No. 1 cast, Chicago*	21.00	21.00	21.00	16.75

*Changed to gross ton basis on April 3, 1941.

Coke, Connellsville:				
(Per Net Ton at Oven)				
Furnace coke, prompt	$6.125	$6.125	$6.125	$4.75
Foundry coke, prompt	6.875	6.875	6.875	5.25
Non-Ferrous Metals:				
(Cents per Lb. to Large Buyers)				
Copper, electro., Conn.*	12.00	12.00	12.00	11.00
Copper, Lake, New York	12.00	12.00	12.00	11.00
Tin (Straits), New York	53.00	52.00	53.50	51.375
Zinc, East St. Louis	7.25	7.25	7.25	6.25
Lead, St. Louis	5.70	5.70	5.70	4.60
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

*Mine producers only.

The various basing points for finished and semi-finished steel are listed in the detailed price tables, page 132 herein. On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in the detailed price tables.

. . . Composite Prices

FINISHED STEEL	PIG IRON	SCRAP STEEL
August 12, 1941.....2.261c. a Lb.....	.....$23.61 a Gross Ton.....	.....$19.17 a Gross Ton.....
One week ago .....2.261c. a Lb.....	.....$23.61 a Gross Ton.....	.....$19.17 a Gross Ton.....
One month ago .....2.261c. a Lb.....	.....$23.61 a Gross Ton.....	.....$19.17 a Gross Ton.....
One year ago.....2.261c. a Lb.....	.....$22.61 a Gross Ton.....	.....$18.63 a Gross Ton.....

	High	Low
1941.....	2.261c.,	2.261c.,
1940.....	2.286c., Jan. 2	2.211c., Apr. 16
1939.....	2.286c., Jan. 3	2.236c., May 16
1938.....	2.512c., May 17	2.211c., Oct. 18
1937.....	2.512c., Mar. 9	2.249c., Jan. 4
1936.....	2.249c., Dec. 28	2.016c., Mar. 10
1935.....	2.062c., Oct. 1	2.056c., Jan. 8
1934.....	2.118c., Apr. 24	1.945c., Jan. 2
1933.....	1.953c., Oct. 3	1.792c., May 2
1932.....	1.915c., Sept. 6	1.870c., Mar. 15
1931.....	1.981c., Jan. 13	1.883c., Dec. 29
1930.....	2.192c., Jan. 7	1.962c., Dec. 9
1929.....	2.236c., May 28	2.192c., Oct. 29

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

High	Low
$23.61, Mar. 20	$23.45, Jan. 2
23.45, Dec. 23	22.61, Jan. 2
22.61, Sept. 19	20.61, Sept. 12
23.25, June 21	19.61, July 6
23.25, Mar. 9	20.25, Feb. 16
19.74, Nov. 24	18.73, Aug. 11
18.84, Nov. 5	17.83, May 14
17.90, May 1	16.90, Jan. 27
16.90, Dec. 5	13.56, Jan. 3
14.81, Jan. 5	13.56, Dec. 6
15.90, Jan. 6	14.79, Dec. 15
18.21, Jan. 7	15.90, Dec. 16
18.71, May 14	18.21, Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

High	Low
$22.00, Jan. 7	$19.17, Apr. 10
21.83, Dec. 30	16.04, Apr. 9
22.50, Oct. 3	14.08, May 16
15.00, Nov. 22	11.00, June 7
21.92, Mar. 30	12.92, Nov. 10
17.75, Dec. 21	12.67, June 9
13.42, Dec. 10	10.33, Apr. 29
13.00, Mar. 13	9.50, Sept. 25
12.25, Aug. 8	6.75, Jan. 3
8.50, Jan. 12	6.43, July 5
11.33, Jan. 6	8.50, Dec. 29
15.00, Feb. 18	11.25, Dec. 9
17.58, Jan. 29	14.08, Dec. 3

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Prices of Finished Iron and Steel...

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point → / Product ↓	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled [1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long ternes [2]	3.80¢		3.80¢									4.55¢			
STRIP															
Hot rolled [3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled [4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester =3.00¢)					2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester =3.35¢)					3.05¢	3.31¢	
TIN PLATE															
Standard cokes, base box	$5.00	$5.00	$5.00						$5.10						$5.32
BLACK PLATE															
29 gage [5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (10)			3.37¢
TERNES, M'FG.															
Special coated, base box	$4.30		$4.30						$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth =2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel [6]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet) [7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢	2.39¢	
Reinforcing (rail) [7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢	2.25¢		2.47¢
Cold finished [8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit =2.70¢)					3.01¢	2.97¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢		(Bethlehem, Massilon, Canton =2.70¢					2.80¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
								(Coatesville and Claymont =2.10¢)							
PLATES															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢(11)		2.45¢	2.65¢		2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	3.67¢
Alloy	3.50¢	3.50¢			(Coatesville =3.50¢)									3.70¢	3.37¢
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem =2.10¢)			2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester =3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester =4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester =6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester =8.55¢)								
WIRE [9]															
Bright	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester =2.70¢)								2.92¢
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester =2.70¢)								2.92¢
Spring	3.20¢	3.20¢		3.20¢			(Worcester =3.30¢)								3.52¢
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢
IRON BARS															
Common		2.25¢			(Terre Haute, Ind. =2.15¢)										
Wrought single refined	4.40¢														
Wrought double refined	5.40¢														

[1] Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. [2] Unassorted 8-lb. coating. [3] Widths up to 12 in. [4] Carbon 0.25 per cent and less. [5] Applies to certain width and length limitations. [6] For merchant trade. [7] Straight lengths as quoted by distributers. [8] Also shafting. For quantities of 20,000 to 39,999 lb. [9] Carload lot to manufacturing trade. [10] Boxed. [11] Ship plates only.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2 higher; f.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Shell Steel

Basic open hearth shell steel, f.o.b. Pittsburgh and Chicago.

	Per Gross Ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)	*Per Lb.*
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

Alloy Steel Blooms, Billets and Slabs

	Per Gross Ton
Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem	$54.00

TOOL STEEL

(F.o.b. Pittsburgh)

	Base per Lb.
High speed	67c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

PIG IRON

All prices set in bold face type are maxima established by OPACS on June 24, 1941. Other domestic prices are delivered quotations per gross ton computed on the basis of the official maxima.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorous	Charcoal	
Boston	$25.50	$25.00	$26.50	$26.00	.....	.....	
Brooklyn	27.50	.....	.....	28.00	.....	.....	
Jersey City	26.53	26.03	27.53	27.03	.....	.....	
Philadelphia	25.84	25.34	26.84	26.34	.....	.....	
Bethlehem, Pa.	**$25.00**	**$24.50**	**$26.00**	**$25.50**	.....	.....	
Everett, Mass.	**25.00**	**24.50**	**26.00**	**25.50**	.....	.....	
Swedeland, Pa.	**25.00**	**24.50**	**26.00**	**25.50**	.....	.....	
Steelton, Pa.	.....	**24.50**	.....	.....	**$29.50**	.....	
Birdsboro, Pa.	**25.00**	**24.50**	**26.00**	**25.50**	**29.50**	.....	
Sparrows Point, Md.	**25.00**	**24.50**	.....	.....	.....	.....	
Erie, Pa.	**24.00**	**23.50**	**25.00**	**24.50**	.....	.....	
Neville Island, Pa.	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....	
Sharpsville, Pa.*	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....	
Buffalo	**24.00**	**23.00**	**25.00**	**24.50**	**29.50**	.....	
Cincinnati	24.44	24.61	.....	25.11	.....	.....	
Canton, Ohio	25.39	24.89	25.89	25.39	.....	.....	
Mansfield, Ohio	25.94	25.44	26.44	25.94	.....	.....	
St. Louis	24.50	24.02	.....	.....	.....	.....	
Chicago	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....	$31.34
Granite City, Ill.	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....	
Cleveland	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....	
Hamilton, Ohio	**24.00**	**23.50**	.....	**24.00**	.....	.....	
Toledo	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....	
Youngstown*	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....	
Detroit	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....	
Lake Superior fc.	.....	.....	.....	.....	.....	**$28.00**	
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	**33.00**	
St. Paul	26.63	.....	27.13	26.63	.....	.....	
Duluth	**24.50**	.....	**25.00**	**24.50**	.....	.....	
Birmingham	**20.38**	**19.00**	**25.00**	.....	.....	.....	
Los Angeles	27.50	.....	.....	.....	.....	.....	
San Francisco	27.50	.....	.....	.....	.....	.....	
Seattle	27.50	.....	.....	.....	.....	.....	
Provo, Utah	**22.00**	.....	.....	.....	.....	.....	
Montreal	27.50	27.50	.....	28.00	.....	.....	
Toronto	25.50	25.50	.....	26.00	.....	.....	

GRAY FORGE IRON

Valley or Pittsburgh furnace **$23.50**

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade (1.75 per cent to 2.25 per cent).

Phosphorous Differential: Basing point prices are subject to a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over.

† Price shown is for low-phosphorous iron; high-phosphorous sells for $28.50 at the furnace.

Manganese Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

WAREHOUSE PRICES

	Pittsburgh	Chicago	Cleveland	Philadelphia	New York	Detroit	Buffalo	Boston	Birmingham	St. Louis	St. Paul	Milwaukee	Los Angeles
Sheets, hot rolled	$3.35	$3.05	$3.35	$3.75	$3.58	$3.43	$3.25	$3.71	$3.45	$3.39	$3.30	$3.38	$5.10
Sheets, cold rolled	....	4.10	4.05	4.05	4.60	4.30	4.30	3.68	....	4.24	4.35	4.23	7.30
Sheets, galvanized	4.75	4.60	4.62	5.00	5.00	4.84	4.75	5.11	4.75	4.99	4.75	4.98	6.30
Strip, hot rolled	3.60	3.40	3.50	3.95	3.96	3.68*	3.82	4.06	3.70	3.74	3.65	3.73	....
Strip, cold rolled	3.20	3.30	3.20	3.31	3.51	3.20	3.52	3.46	....	3.61	3.83	3.54	....
Plates	3.40	3.55	3.40	3.75	3.76	3.60	3.62	3.85	3.55	3.69	3.80	3.68	4.95
Structural shapes	3.40	3.55	3.58	3.75	3.75	3.65	3.40	3.85	3.55	3.69	3.80	3.68	4.95
Bars, hot rolled	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.64	3.75	3.63	**4.15
Bars, cold finished	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300	7.20	7.10	7.55	7.31	7.60	7.67	7.35	7.50	....	7.72	7.45	7.58	10.35
Bars, ht. rld. SAE 3100	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	....	6.02	6.00	5.88	9.35
Bars, cd. drn. SAE 2300	8.15	8.15	8.40	8.56	8.84	8.70	8.40	8.63	....	8.77	8.84	8.63	11.35
Bars, cd. drn. SAE 3100	6.75	6.75	7.75	7.16	7.19	7.05	6.75	7.23	....	7.12	7.44	6.98	10.35

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb., cold rolled strips, 0.0971 in. thick; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb., cold rolled strip 0.095 in. and lighter; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb.; New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, cold rolled sheets, 300 to 1999 lb., galvanized sheets, 24 ga.—1 to 1499 lb. Extras for size, quality, etc., apply on above quotations. *12 gage and heavier, $3.43. **Over 4 in. wide and over 1 in. thick, $4.95.

CORROSION AND HEAT-RESISTING STEELS

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30,00c.	28.00c.
Drawn wire	25.00c	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c	17.50c.	24.00c.	35.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. per 100 lb.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, per Package of 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00
25-lb. coating I.C.	8.00	16.00
30-lb. coating I.C.	8.63	17.25
40-lb. coating I.C.	9.75	19.50

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and Carriage Bolts:

6 ½ in., shorter and smaller	65½
6 x ⅝ in., and shorter	63½
6 in. by ¾ to 1 in. and shorter	61
1⅛ in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:

(hexagon or square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 to 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose	71 and 10
Stove bolts in packages, with nuts attached	71
Stove bolts in bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York lots of 200 lb. or over.

Large Rivets

(½ in. and larger)

Base per 100 Lb.

F.o.b Pittsburgh, Cleveland, Chicago, Birmingham $3.75

Small Rivets

(7/16 in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ..... 65 and 5

Cap and Set Screws

Per Cent Off List

Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Filister head cap, listed sizes	51

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

WIRE PRODUCTS

(To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

Base per Keg

Standard wire nails	$2.55
Coated nails	2.55
Cut nails, carloads	3.85

Base per 100 Lb.

Annealed fence wire	$3.05

Base Column

Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barbless wire	70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

Note: Birmingham base same on above items, except spring wire.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

	Seamless Cold Drawn	Hot Rolled	Lap Weld, Hot Rolled
	$	$	$
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe)

Base Price = $200 Per Net Ton

Steel (Butt Weld)

	Black	Galv.
½ in.	63½	51
¾ in.	66½	55
1 to 3 in.	68½	57½

Wrought Iron (Butt Weld)

½ in.	24	3½
¾ in.	30	10
1 and 1¼ in.	34	16
1½ in.	38	18½
2 in.	37½	18

Steel (Lap Weld)

2 in.	61	49½
2½ and 3 in.	64	52½
3½ to 6 in.	66	54½

Wrought Iron (Lap Weld)

2 in.	30½	12
2½ to 3½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17

Steel (Butt, extra strong, plain ends)

	Black	Galv.
½ in.	61½	50½
¾ in.	65½	54½
1 to 3 in.	67	57

Wrought Iron (Same as Above)

½ in.	25	6
¾ in.	31	12
1 to 2 in.	38	19½

Steel (Lap, extra strong, plain ends)

2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56

Wrought Iron (Same as above)

2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 8 in. and smaller.

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago	$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle	56.00

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is $45 at Birmingham and $53.80 delivered Chicago.

FUEL OIL

No. 3, f.o.b. Bayonne, N. J.	4.90c.
No. 6, f.o.b. Bayonne, N. J.	3.21c.
No. 6 Bur. Stds., del'd Chicago.	2.75c.
No. 3 distillate del'd Cleveland.	6.25c.
No. 4 indus., del'd Cleveland.	5.75c.
No. 6 indus., del'd Cleveland.	5.00c.

Sell Your Scrap **NOW** *and Aid National Defense*

AN uninterrupted and augmented flow of iron and steel scrap is essential to National Defense. Without it, steel plants, blast furnaces and foundries will be unable to function at maximum efficiency.

We urge every industrial plant to make an immediate clean-up of its yards to see that every available ton of iron and steel scrap is made ready for immediate shipment, and we also urge that steps be taken so that every ton of future production of scrap is conserved for remelting.

Grades of scrap which under normal conditions would not find a ready market are now acceptable because of the dire need for everything that can be remelted to make war material.

Whether you dispose of your scrap through us or some other agency, we urge you to facilitate the flow of scrap to the iron and steel industry with all possible speed.

We have been specialists in iron and steel scrap for 40 years, serving the Atlantic Seaboard and the Pittsburgh district through our offices in Philadelphia, Pittsburgh and Worcester. If you have any problems in connection with the disposal of your scrap, we shall be glad to place our experience and facilities at your service without obligation.

In the interest of adequate National Defense we are anxious to do our utmost in cooperating with the Office of Production Management in the procurement of scrap and with the Office of Price Administration and Civilian Supply in the maintenance of reasonable prices.

We take pleasure in announcing that C. E. Wright, who has been on the editorial staff of The Iron Age for 21 years and who for the past five years has been Managing Editor of that publication, has joined the Charles Dreifus Company as Vice-President. In 25 years' connection with the iron and steel industry, of which three years were spent with one of the large steel companies, he has won recognition as an authority on iron and steel markets, including the marketing of scrap. Mr. Wright is available for consultation on any matter pertaining to the disposal of your scrap.

THE CHARLES DREIFUS COMPANY

PHILADELPHIA
Widener Building
Rittenhouse 7750

PITTSBURGH
Oliver Building
Atlantic 1856

WORCESTER, MASS.
Park Building
6-2535

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, Domestic, 80%, per gross ton (carloads)...$120.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....$36.00
Domestic, 26 to 28%..... 49.50

Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)

50% (carload lots, bulk).....$74.50*
50% (ton lots, packed)..... 87.00*
75% (carload, lots, bulk).....135.00*
75% (ton lots, packed).....151.00*

Bessemer Ferrosilicon

(Per Gross Ton, F.o.b. Jackson, Ohio)

10.00 to 10.50 .....$34.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2% $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

(Per Gross Ton, F.o.b. Jackson, Ohio)

5.00 to 5.50 .....$28.50

For each additional 0.5% silicon up to 11%, 50c. a ton is added. Above 11% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

(Per Lb. Contained Cr, Delivered Carlots, Lump Size, on Contract)

4 to 6 carbon .....11.00c.
2 carbon .....17.50c.
1 carbon .....18.50c.
0.10 carbon .....20.50c.
0.06 carbon .....21.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

(Per Gross Ton, Delivered, Lump Size, Bulk, on Contract)

3 carbon $113.00*
2.50 carbon 118.00*
2 carbon 123.00*
1 carbon 133.00*

Other Ferroalloys

Ferrotungsten, per lb. contained W, del'd carload..... $2.00
Ferrotungsten, 100 lb. and less $2.25
Ferrovanadium, contract, per lb. contained V, del'd $2.70 to $2.90†
Ferrocolumbium, per lb. contained Cb, f.o.b. Niagara Falls, N. Y., ton lots..... $2.25†
Ferrocarbontitanium, 15-18 Ti, 7-8 C, f.o.b. furnace, carload, contract, net ton.....$142.50
Ferrocarbontitanium, 17-20 Ti, 3-5 C, f.o.b. furnace, carload, contract, net ton.....$157.50
Ferrophosphorus, electric or blast furnace material, carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage freight, equalized with Rockdale, Tenn., gross ton..... $58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsato (Siglo), Tenn., $3 unitage, freight equalized with Nashville, gross ton..... $75.00
Ferromolybdenum, per lb. Mo, f.o.b. furnace ..... 95c.
Calcium molybdate, per lb. Mo, f.o.b. furnace..... 80c.
Molybdenum oxide briquettes 48-52 Mo, per lb. contained Mo, f.o.b. Langeloth, Pa.... 80c.
Molybdenum oxide, in cans, per lb. contained Mo, f.o.b. Washington, Pa. ..... 80c.

*Spot prices are $5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores (51.50% Fe.)

(Delivered Lower Lake Ports)

Per Gross Ton

Old range, bessemer, 51.50.... $4.75
Old range, non-bessemer, 51.50 4.60
Mesaba, bessemer, 51.50..... 4.60
Mesaba, non-bessemer, 51.50... 4.45
High phosphorus, 51.50..... 4.35

Foreign Ores*

(C.i.f. Philadelphia or Baltimore, Exclusive of Duty)

Per Unit

African, Indian, 44-48 Mn..57c. to 61c.
African, Indian, 49-51 Mn..60c to 65c.
Brazilian, 46-48 Mn.....54c. to 59c.
Cuban, del'd, 51 Mn....67½c. to 71c.

Per Short Ton Unit

Tungsten, Chinese Wolframite, duty paid, delivered.....$23 to $24
Tungsten, domestic scheelite, delivered $23.00
Chrome ore, lump, c.i.f. Atlantic Seaboard, per gross ton; South African (low grade).....Nom.
Rhodesian, 45 .....$25.00
Rhodesian, 48 .....$28.00 to $30.00

*Importations no longer readily available. Prices shown are nominal.

COKE

Per Net Ton

Furnace

F.o.b. Connellsville, prompt, $6.00 to $6.25

Foundry

F.o.b. Connellsville, prompt, $6.75 to $7.00

By-product, Chicago $10.50
By-product, New England.....$13.75
By-product, Newark..$12.40 to $12.95
By-product, Philadelphia $12.13
By-product, Cleveland $12.30
By-product, Cincinnati $11.75
By-product, Birmingham $8.50
By-product, St. Louis.$10.75 to $11.00

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton $40.00
Angle bars, 100 lb. 2.70

(F.o.b. Basing Points) Per Gross Ton

Light rails (from billets).....$40.00
Light rails (from rail steel)... 39.00

Base per Lb.

Cut spikes ..... 3.00c.
Screw spikes ..... 5.15c.
Tie plates, steel ..... 2.15c.
Tie plates, Pacific Coast ..... 2.30c.
Track bolts, steam railroads... 4.15c.
Track bolts, jobbers discount.. 63-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneaqua, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

FLUORSPAR

Per Net Ton

Domestic washed gravel. 85-5 f.o.b. Kentucky and Illinois mines, all rail.....$20.00 to $21.00
Domestic, f.o.b. Ohio River landing barges .....20.00 to 21.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines....20.00 to 21.00
Foreign, 85% calcium fluoride, not over 5% Si, c.i.f. Atlantic ports, duty paid.....Nominal
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines.... 31.00
As above, in bags, f.o.b. same mines 32.60

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick *Per 1000*

Super-duty brick, St. Louis....$60.80
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois 47.50
First quality, New Jersey..... 52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri, and Illinois 42.75
Second quality, New Jersey.... 9.00
No. 1, Ohio 39.90
Ground fire clay, net ton..... 7.10

Silica Brick

Pennsylvania $47.50
Chicago District 55.10
Birmingham 47.50
Silica cement, net ton (Eastern) 8.55

Chrome Brick *Per Net Ton*

Standard, f.o.b. Baltimore, Plymouth Meeting and Chester...$50.00
Chemically bonded, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. 50.00

Magnesite Brick

Standard f.o.b. Baltimore and Chester $72.00
Chemically bonded, f.o.b. Baltimore 61.00

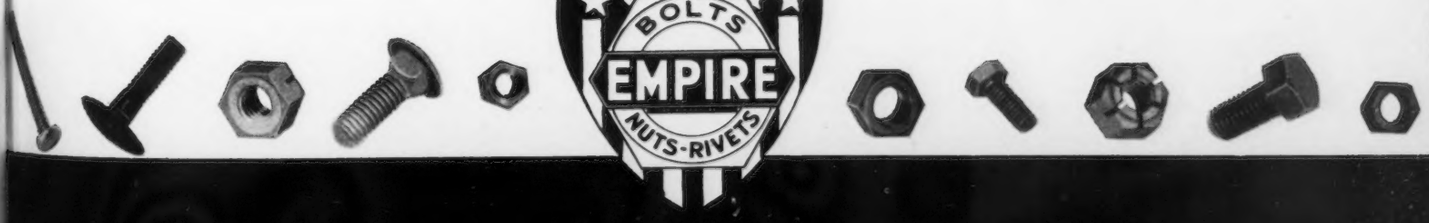
Grain Magnesite

Domestic, f.o.b. Baltimore and Chester in sacks.....$40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk) 22.00

SHIPS FOR DEFENSE! TANKS FOR DEFENSE!
BOLTS AND NUTS FOR DEFENSE!

Which comes First?

Probably there is no single item made by American Industry more generally used in all defense products than bolts and nuts, rivets and other industrial fastenings. A billion dollars worth of castings, forgings, stampings, engine parts, can be of no use to the defense program unless there is available a necessary supply of such fastenings. • It is our problem to produce these vital products in record-breaking tonnage, so that no interruption may occur in the assembly of that vast array of materials required for the Arsenal of Defense. • To that task we direct the full energies of the entire RB&W organization in our three strategically located plants.



RUSSELL, BURDSALL & WARD

BOLT AND NUT COMPANY

PORT CHESTER, N. Y. ROCK FALLS, ILL. CORAOPOLIS, PA.

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SALES POSSIBILITIES

. . . CONSTRUCTION, PLANT EXPANSION AND EQUIPMENT BUYING

North Atlantic States

• **Milford Rivet & Machine Co.**, Milford, Conn., has let general contract to O. F. Burghart, Island Brook Avenue, Bridgeport, Conn., for one-story addition, 30 x 110 ft. Cost close to $45,000 with equipment. Leo F. Caproni, 1221 Chapel Street, New Haven, Conn., is architect and engineer.

Standard Machinery Co., Inc., 1475 Elmwood Avenue, Cranston, Providence, R. I., swaging and wire-drawing machinery, presses, tools, etc., has let general contract to A. C. Beals Co., 63 Bassett Street, for one-story addition, 80 x 120 ft., for a machine shop. Cost close to $60,000 with equipment. Jenks & Ballou, Industrial Trust Building, are architects and engineers.

Boston Edison Co., 39 Boylston Street, Boston, has approved plans for expansion in steam-electric generating station at Everett, Mass., including new 50,000-kw. turbine-generator unit, high-pressure boiler and axuiliary equipment. Cost over $3,500,000. Award for generator has been made to General Electric Co. and contracts for other equipment will be made soon.

American Bosch Corp., Springfield, Mass., injection equipment for automotive and diesel engines, parts, etc., plans expansion for production of aircraft apparatus for Navy Department. Fund of about $761,400 has been secured through Defense Plant Corp., Washington, for project.

Blanchard Machine Co., 64 State Street, Cambridge, Mass., grinding machines and parts, has let general contract to J. W. Bishop Co., 100 Erie Street, for one-story addition, 45 x 90 ft. Cost close to $45,000 with equipment.

Monsanto Chemical Co., Monsanto Avenue, Springfield, Mass., has let general contract to Adams & Ruxton Construction Co., 1387 Main Street, for two-story steam power plant, 40 x 70 ft. Cost close to $75,000 with boiler unit and auxiliary equipment. Charles T. Main, Inc., 201 Devonshire Street, Boston, is consulting engineer.

Castanea Paper Co., 230 Park Avenue, New York, book and other paper stocks, has let general contract to John W. Ferguson Co., Paterson, N. J., for one-story and basement addition to pulp mill, 70 x 170 ft., at Johnsonburg, Pa. Cost over $115,000 with equipment.

Imperial Laundry Machinery Corp., 34-11 Vernon Boulevard, Long Island City, laundry machinery and parts, has leased one-story building at 245 Huron Street, Brooklyn, about 10,000 sq. ft. of floor space, for plant.

Revere Copper & Brass, Inc., 230 Park Avenue, New York, plans new works at Baltimore for production of naval equipment for government. Fund of $3,100,000 will be provided by Defense Plant Corp., Washington, for project, of which approximately $1,700,000 will be used for purchase of equipment, remainder for land and buildings.

American Export Lines, Inc., 25 Broadway, New York, has leased new seaplane hangar, 126 x 226 ft., to be erected at La Guardia Field, North Beach, by City Department of Docks, New York, to include two-story extension, 36 x 154 ft., for reconditioning and repair shop, and other service. Cost about $500,000 with equipment.

Columbian Carbon Co., 41 East 42nd Street, New York, plans new carbon black manufacturing plant at Hobbs, N. M., with compressor station, storage and distributing buildings, boiler house and other structures. Natural gas for processing will be secured from gas wells of Skelly Oil Co., in nearby district. Cost over $250,000 with machinery.

General Baking Co., 420 Lexington Avenue, New York, plans new one-story branch plant in Scott district, Richmond, Va. Cost over $100,000 with traveling ovens, mixers, conveyors, loaders and other mechanical equipment. Paul Monaghan, 1518 Locust Street, Philadelphia, is architect.

Moore Steam Turbine Division, Worthington Pump & Machinery Corp., Wellsville, N. Y., has asked bids on general contract for two-story addition, about 35 x 75 ft. Cost close to $50,000 with equipment.

Bell Aircraft Corp., 2050 Elmwood Avenue, Buffalo, plans addition to branch plant recently completed at Wheatfield, near Niagara Falls, N. Y., for production of aircraft parts for government. Fund of $8,456,175 has been secured through Defense Plant Corp., Washington. Company also is arranging for common stock issue to approximate $2,000,000, part of fund to be used for purchase of equipment.

Rane Tool Co., Inc., Ross Street, Jamestown, N. Y., dies, jigs, tools, etc., has asked bids on general contract for one-story addition, 55 x 85 ft. Cost close to $50,000 with equipment.

Solvay Process Co., 40 Rector Street, New York, industrial chemicals, plans new plant at works at Solvay, N. Y., for production of synthetic phenol (coal tar acid), under a new process, used in plastics manufacture. Cost over $500,000 with equipment.

Commanding Officer, Fort Monmouth, N. J., has let general contract to Ehret-Day Co., Asbury Park, N. J., for initial units of new anti-aircraft detection laboratory at local depot. Entire project will cost $1,270,000 for buildings and equipment.

Tietjen & Lang Dry Dock Co., 17th Street and Park Avenue, Hoboken, N. J., subsidiary of Todd Shipyards Corp., 1 Broadway, New York, plans expansion in shipbuilding and repair plant for conversion and repair of vessels for government, including drydocks, shops and other structures. Fund of $5,760,000 has been arranged through Defense Plant Corp., Washington, for project.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until Aug. 19 for electrical wire (Circular 231), machine bolts and screws (Circular 233), gilding metal strip (Circular 230).

War Department, Washington, plans new general storage depot at Shamokin, Pa., comprising one-story storage and distributing buildings, mechanical shops, general service buildings and other structures. Cost about $1,000,000 with equipment. Appropriation in amount noted is being arranged.

Howell Mfg. Co., foot of Eddystone Avenue, Eddystone, Philadelphia, overhead doors and kindred products, has purchased building at Hasbrook Street and Cottman Avenue, Philadelphia, on site, 60 x 535 ft., for expansion.

Lukenweld, Inc., Coatesville, Pa., subsidiary of Lukens Steel Co., weldments, chemical drying equipment, etc., plans further expansion for production of equipment for government, and has secured additional fund of $310,000 through Defense Plant Corp., Washington.

United States Engineer Office, New Post Office Building, Pittsburgh, asks bids until Aug. 18 for two vertical, triplex, single-acting, power-driven oil pumps, with all parts (Invitation 22); until Aug. 20, one vertical, triplex, single-acting water pump, with all parts (Invitation 23); until Aug. 21, one oil supply pump (Invitation 29).

Standard Metal Products Co., Ninth Street and Pittsburgh & Lake Erie Railroad, Braddock, Pa., general metal goods, has let general contract to J. A. Ramano, 6399 Morrowfield Avenue, for new one-story plant, 40 x 255 ft., with one-story office building adjoining. Cost over $80,000 with equipment.

Allegheny Ludlum Steel Corp., Oliver Building, Pittsburgh, plans one-story addition to branch plant at Watervliet, N. Y., for expansion in hammer shop and other departments. Cost about $180,000 with equipment.

Procurement Division, Treasury Department, Washington, asks bids until Aug. 22 for pipe fittings, etc., as required from Dec. 1, 1941, to Nov. 30, 1942, including galvanized iron or steel conduit bushings, conduit clamps, locknuts, pipe straps, nipples, elbows, flanges, hangers, steam and water valves, unions and other pipe fittings (Class 45).

Maryland Bolt & Nut Co., Mount Washington Street, Baltimore, bolts, nuts, studs, etc., has let general contract to Cummins Construction Co., 803 Cathedral Street, for new one-story plant at 1330 Smith Avenue. Cost close to $45,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 19 for 5000 pairs of tinners' shears, 6000 pairs of sailmakers' shears (Schedule 8192) for Eastern and Western Navy yards; two fresh water pumps, with motors and controllers (Schedule 8167) for Puget Sound yard; 5000 ft. of single-conductor lighting and power wire, 3200 lb. of solid weatherproof wire (Schedule 8153) for Oakland, Cal., yard.

The South

• **Reynolds Metals Co.**, 311 West Broadway, Louisville, aluminum, metal foils, etc., has leased vacant plant on South Twelfth Street, totaling 125,000 sq. ft. of floor space, for production of containers with metal caps for powder shipping. Cost about $250,000 with machinery.

John Deere Plow Co., Moline, Ill., has let general contract to J. M. Gregory, 135 South Salisbury Street, Raleigh, N. C., for one-story factory branch, storage and distributing plant at Raleigh. Cost close to $50,000 with equipment.

Alabama Dry Dock & Ship Building Co., Inc., Mobile, Ala., plans expansion for repair and maintenance of vessels for government, including new docks, machine shops, and other structures. Cost estimated at $5,010,000. Fund in that amount will be furnished by Defense Plant Corp., Washington.

Constructing Quartermaster, Fort Moultrie, Ga., plans early call for bids for 150,000-gal. elevated steel tank and tower for water service.

Dallas Power & Light Co., Dallas, Ga., plans expansion in Mountain Creek electric generating station, including equipment to more than double present capacity; also will make extensions in transmission lines. Cost over $2,200,000.

War Department, Washington, has let contract to C. G. Kershaw Construction Co., Birmingham, for initial buildings of new arsenal for Chemical Warfare Service, near Huntsville, Ala., consisting of one and multi-story units for chemical manufacture, loading chemical shells, storage and distribution, machine shops, power house and other structures. Project will cost about $29,000,000 with equipment.

International Harvester Co., 180 North Michigan Avenue, Chicago, has asked bids on general contract for one and two-story factory branch, storage and distributing plant at Dallas, Tex. Cost over $60,000 with equipment.

Interstate Cotton Oil Refining Co., Sherman, Tex., cottonseed oil products, has let general contract to Wood & Elliott, Sherman, for two-story addition, 115 x 180 ft., for storage and distribution, and for three-story production building, 40 x 50 ft. Cost over

BOWER
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Detroit, Michigan
For NATIONAL SECURITY

$65,000 with equipment. James R. Grady, M. & P. Bank Building, is architect.

Todd-Johnson Dry Docks, Inc., New Orleans, plans expansion for maintenance and repair of vessels for government, including new docks, construction and repair shops and other structures. Cost about $3,140,000. Fund in that amount will be furnished by Defense Plant Corp., Washington, for project.

Central States

● **Cleveland Diesel Engine Division,** General Motors Corp., 2160 West 106th Street, Cleveland, has let general contract to Austin Co. for one-story addition, 100 x 250 ft., for expansion in main production division; also for three-story office building addition, 40 x 75 ft. Cost over $175,000 with equipment.

Jeffrey Mfg. Co., East First Avenue, Columbus, Ohio, conveying, elevating and other mechanical-handling equipment, has let general contract to E. Elford & Sons, 555 South Front Street, for one-story addition, about 70 x 280 ft. Cost over $80,000 with equipment.

Lone Star Defense Corp., recently organized subsidiary of B. F. Goodrich Co., Inc., Akron, Ohio, will have plans prepared by Prack & Prack, Martin Building, architects, and J. N. Chester Engineers, 210 East Park Way, consulting engineers, both Pittsburgh, for new bomb and shell-loading plant for government, on 24,300-acre tract near Texarkana, Tex., lately noted in these columns. Cost about $33,500,000. Fund in that amount will be furnished by Defense Plant Corp., Washington.

Tinnerman Products, Inc., 2038 Fulton Street, Cleveland, speed nuts, fasteners, clips, etc., has let general contract to Austin Co. for new two-story plant, about 10,000 sq. ft. of floor space, at 2079 Japan Street. Cost over $50,000 with equipment.

Cleveland Chain & Mfg. Co., Broadway and Henry Streets, Cleveland, welded and other heavy chain, is erecting one and two-story additions, 40 x 80 ft., and 40 x 60 ft., for which general contract recently was let to E. J. Benes & Co., Terminal Tower Building. Cost close to $60,000 with equipment. Edward G. Hoefler, 5005 Euclid Avenue, is architect and engineer.

Frigidaire Division, General Motors Corp., Taylor Street, Dayton, Ohio, electric refrigerators and parts, will take bids soon on general contract for one-story addition for parts production and assembling of ordnance equipment for government. Cost close to $1,000,000 with machinery. Schenck & Williams, Winters Building, are architects.

Shell Oil Co., Shell Building, St. Louis, plans new gas recycling plant for natural gasoline production in Chapel Hill district, Smith County, Tex., including compressor station, boiler house, machine shop and other structures. Cost close to $200,000 with equipment.

Cardwell Mfg. Co., Inc., 807 South Wichita Street, Wichita, Kan., oil field winches, parts and kindred mechanical equipment, has approved plans for one-story addition, 109 x 178 ft., for new assembling works. Cost over $65,000 with equipment.

City Council, Columbia, Mo., asks bids until Aug. 18 for extensions and improvements in municipal power plant, including new boiler unit with rated capacity of about 60,000 lb. of steam per hr., superheater, soot blowers, furnaces and setting, fuel economizer, stoker, mechanical-draft equipment, fly ash removal equipment, steel stack, soot hoppers and auxiliary equipment. Cost about $140,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Detroit Diesel Engine Division, General Motors Corp., 13400 West Outer Drive, Detroit, has let general contract to E. F. Eiserman & Sons, Farwell Building, for one-story addition for expansion in heat-treating department. Cost over $85,000 with equipment.

Eaton Mfg. Co., 739 East 140th Street, Cleveland, automobile axles, bumpers, springs, etc., plans expansion in plant at Battle Creek, Mich., for production of aircraft parts for government. Fund of $173,950 will be secured through Defense Plant Corp., Washington, for equipment.

Lyon, Inc., 197 South Waterman Avenue, Detroit, automobile rims and other automotive equipment, plans new one-story plant, 200 x 500 ft. Cost over $150,000 with equipment. Smith, Hinchman & Grylls, Marquette Building, are architects.

Republic Aircraft Products Corp., 5914 Federal Street, Detroit, airplane equipment and parts, has let general contract to Austin Co., Cleveland, for one-story addition. Cost close to $50,000 with equipment.

Burroughs Adding Machine Co., 6071 Second Street, Detroit, accounting machines and parts, plans one-story addition to branch plant at Plymouth, Mich. Cost over $80,000 with equipment.

Anderson-Bolling Mfg. Co., Grand Haven, Mich., metal stampings, has begun work on new one-story branch plant at Spring Lake, Mich. Cost over $45,000 with equipment.

American Spring & Wire Specialties Co., 816 North Spaulding Avenue, Chicago, will take bids soon on general contract for one-story top addition to present one-story plant. Cost over $50,000 with equipment. Fox & Fox, 549 West Randolph Street, are architects.

American Electric Fusion Corp., 2610 West Diversey Avenue, Chicago, electric welding apparatus, etc., has let general contract to Olsen & Voss, 5927 West Belmont Avenue, for one and two-story addition, 60 x 125 ft., and improvements in present works, for production of tube-making machines for government. Cost close to $100,000 with equipment. Harold N. Knudsen, 5363 West Crystal Street, is architect.

Allis-Chalmers Mfg. Co., South Seventieth Street, West Allis, Wis., has let general contract to Meredith Brothers, Inc., 121 East Washington Street, Milwaukee, for extensions in shop No. 3, including new galleries, etc. Cost over $65,000 with equipment.

City Council, Waverly, Iowa, asks bids until Aug. 26 for 700-750-kw. diesel engine-generating unit and auxiliary equipment, for municipal power plant, where extensions and improvements will be made. Entire project will cost about $85,000. Stanley Engineering Co., Muscatine, Iowa, is consulting engineer.

Zenith Radio Corp., 6001 West Dickens Street, Chicago, has purchased one-story building in Westside district, about 110,000 sq. ft. of floor space, and will remodel for branch plant for production of radio and signal equipment for Army Signal Corps. Cost over $150,000 with equipment.

Marquette Cement Mfg. Co., 140 South Dearborn Street, Chicago, has let general contract to Kucharo Construction Co., 1901 Easton Boulevard, Des Moines, Iowa, for additions to branch packing plant at Des Moines. Cost over $250,000 with equipment.

Western States

● **Todd-Seattle Dry Docks, Inc.,** Seattle, plans expansion in shipbuilding and repair plant for maintenance and repair of vessels for government. Cost about $1,000,000 with equipment. Fund in that amount will be furnished by Defense Plant Corp., Washington.

American Metal Bearing Co., 2277 East Sixteenth Street, Los Angeles, bronze and other metal bearings, has let general contract to Floyd R. Fisher, 1000 North Hayvenhurst Avenue, for one-story addition. Cost close to $40,000 with equipment. William H. Harrison, Architects' Building, is architect.

Public Works Officer, Puget Sound Navy Yard, Bremerton, Wash., asks bids until Aug. 20 for two eight-wheel locomotive cranes, standard gage, operated by gasoline engines and equipped with electric lighting system, air brakes, etc. (Schedule 10551).

Pacific Vegetable Oil Corp., 62 Townsend Street, San Francisco, has asked bids on general contract for two additions, one-story for storage and distribution, and two-story unit for general operations and administration. Cost close to $85,000 with equipment. Miller & Warnecke, Financial Center Building, Oakland, Cal., are architects.

Western Foundry Co., 2400 S. W. Water Street, Portland, Ore., iron and other metal castings, plans new one-story foundry on S. W. Sheridan Street. Installation will include two 10-ton cranes and other mechanical-handling facilities. Cost close to $65,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, has let contract jointly to L. H. Hoffman, 715 S. W. Columbia Street, Portland, Ore., and Howard S. Wright, 407 Yale Street, Seattle, for seven-story and basement storage and distributing building, 150 x 451 ft., at Puget Sound Navy Yard, at $1,391,409 exclusive of equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 19 for two vertical boring mills, with equipment, spares, tools and wrenches (Schedule 8160), two engine lathes, with equipment and spares (Schedule 8165), all motor-driven; about 20,000 ft. of copper-nickel alloy tubing (Schedule 8169) for Mare Island Navy Yard.

Keenan Pipe & Supply Co., 2112 East Twenty-seventh Street, Vernon, Los Angeles, iron pipe, fittings, etc., is erecting two one-story additions, 70 x 180 ft., and 26 x 78 ft., for storage and distribution. Cost about $45,000 with equipment.

Canada

● **E. B. Eddy Co., Ltd.,** Hull, Que., newsprint and other paper stocks, has awarded general contract to Foundation Co., Ltd., 1538 Sherbrooke Street West, Montreal, for one and multi-story addition to mill for acid manufacture. Cost close to $1,000,000 with machinery.

International Nickel Co., Ltd., Port Colborne, Ont., has let general contract to Nordale Construction Co., Port Colborne, for one-story addition to local mill. Cost over $100,000 with equipment.

Small Electric Motors (Canada), Ltd., 67 Yonge Street, Toronto, is erecting one-story addition, 80 x 140 ft., for which general contract recently was let to R. J. Hibbs Construction Co., Ltd., 15 Trent Street. Cost over $60,000 with equipment. Marani & Morris, 46 Bloor Street West, are architects.

Department of Munitions and Supply, Ottawa, C. D. Howe, minister, has awarded contract to New Brunswick Contractors & Diamond Construction Co., Fredericton, N. B., for an airplane repair depot at Scoudouc, N. B., to cost $118,000, exclusive of equipment.

Department of Munitions & Supply, Ottawa, G. K. Sheils, deputy minister, has awarded general contract to L. G. Ogilvie & Co., Ltd., 1440 St. Catharine Street West, Montreal, for a repair depot, consisting of 22 buildings, at St. John, Que., to cost $400,000 without equipment.

St. John Dry Dock & Shipbuilding Co., Ltd., East St. John, N. B., will build addition, consisting of two berths for 4700-ton ships, to cost $200,000 with equipment.

DeHavilland Aircraft Co. of Canada, Ltd., North York Township, Toronto, Ont., is completing arrangements through A. W. Robertson, Ltd., 57 Bloor Street West, Toronto, for repair plant and additions to cost about $250,000. H. A. Angus, 1221 Bay Street, Toronto, is construction engineer.

Canadian Ingersoll-Rand Co., Ltd., Sherbrooke, Que., will make repairs and additions to plant to cost about $70,000.

Packard Electric Co., 13 Race Street, St. Catharines, Ont., transformers, electrical apparatus, etc., has awarded general contract to C. F. Monk, 399 St. Paul Street, for addition to No. 2 plant to cost about $100,000 with equipment.

Canadian Propellers, Ltd., 1010 St. Catharine Street West, Montreal, has awarded general contract to Collet Freres, Ltd., 1978 Parthenais Street, for plant addition to cost $350,000.